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Infrared Solar Spectrum Observed from a Balloon-Borne Spectrometer
Between 9300 and 11000 Å and Between 12000 and 19000 Å

Aharon Goldman, David G. Murcray,
Frank H. Murcray, and Walter J. Williams
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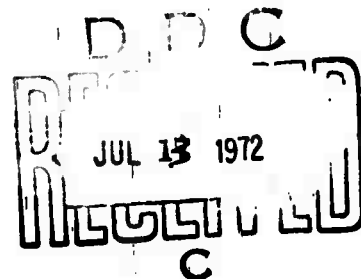
SCIENTIFIC REPORT No. 8

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13. ABSTRACT

Records are presented of the infrared solar spectrum in the 0.9 - 1.4 μ regions, observed from altitudes up to 30 km, with a resolution of 0.5Å. The spectra show many new solar absorption lines which appear only at high altitude records, where the telluric absorptions are eliminated.

14.

KEY WORDS

LINK A

LINK B

LINK C

ROLE

WT

ROLE

WT

ROLE

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Solar Spectrum

Infrared Spectrum

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ic

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ABSTRACT

Records are presented of the infrared solar spectrum in the 0.9 - 1.1 μ and 1.2 - 1.9 μ regions, observed from altitudes up to 30 km, with a resolution of 0.5 \AA . The spectra show many new solar absorption lines which appear only at high altitude records, where the telluric absorptions are eliminated.

SUMMARY

This report completes the presentation of the results obtained during the balloon flight performed August 7, 1967. The flight details were described in a separate report.⁽¹⁾ During this flight, high altitude atmospheric transmittance data was obtained, using the sun as the source. The spectral region scanned was from 1 to 2μ , with a resolution of $\sim 0.5\overset{\circ}{\text{A}}$.

Partial results from this flight were presented in previous publications, which included a few representative lines in the $1-2\mu$ region⁽²⁾ and the complete data obtained in the 1.1μ region⁽³⁻⁴⁾ ($10800 - 12150\overset{\circ}{\text{A}}$). The present report completes the data in the $1-2\mu$ region. The results are presented in the form of an atlas, following similar procedures to those described in Ref. 2-3. The Michigan atlas,⁽⁵⁻⁶⁾ the Arizona-NASA atlas,⁽⁷⁻⁸⁾ the Jungfrauoch atlas⁽⁹⁻¹⁰⁾ and recently calculated line intensities and positions⁽⁴⁾ were used for line identifications.

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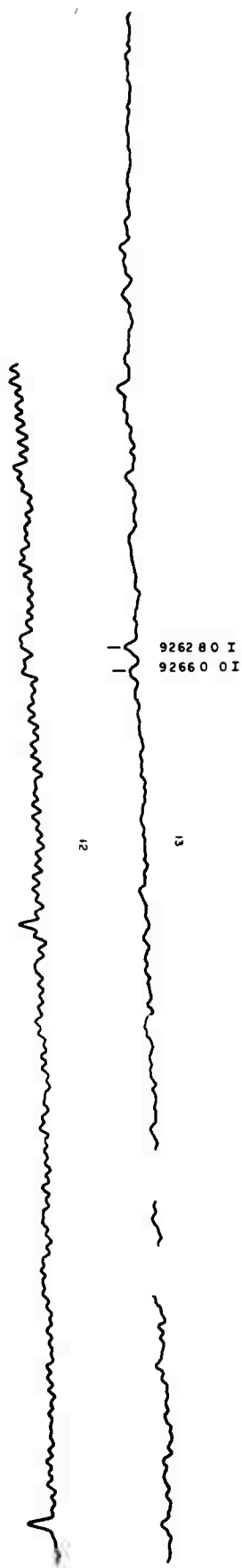
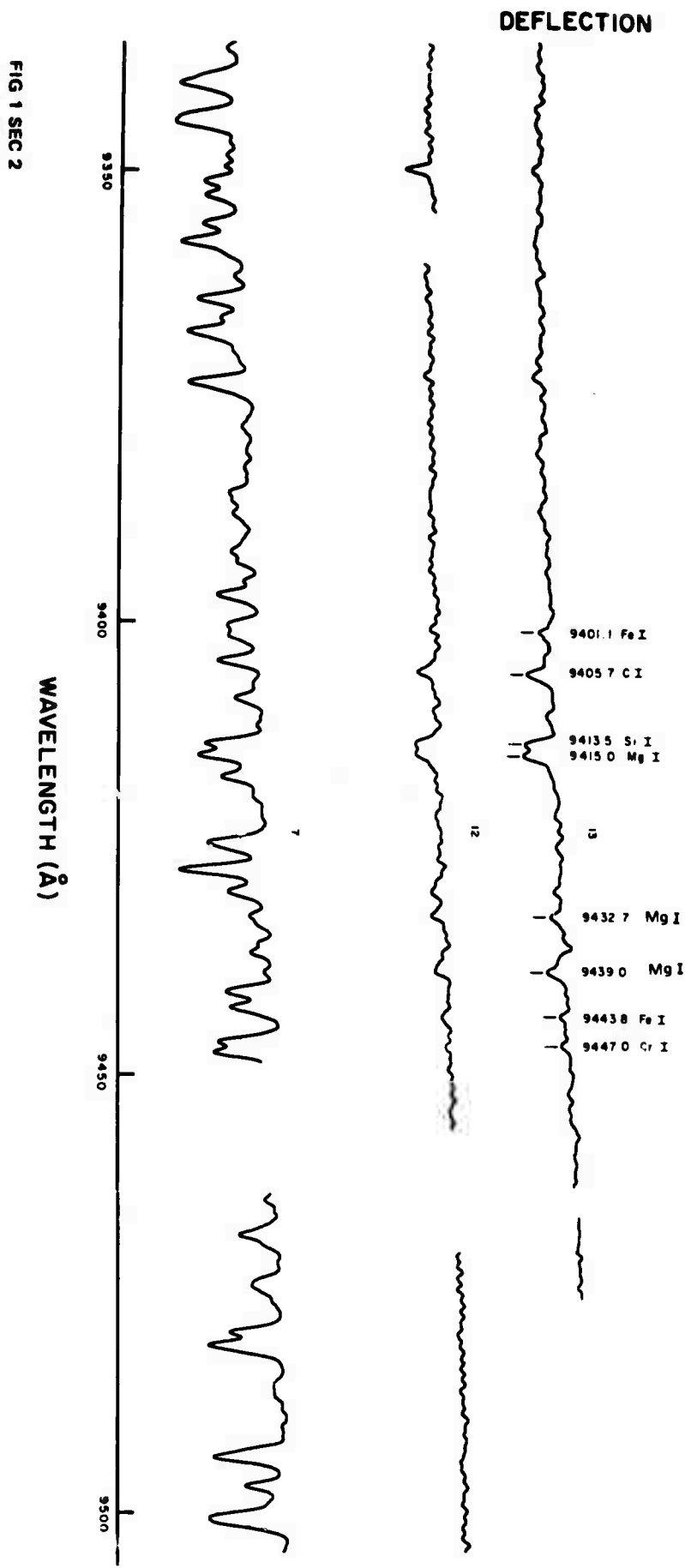
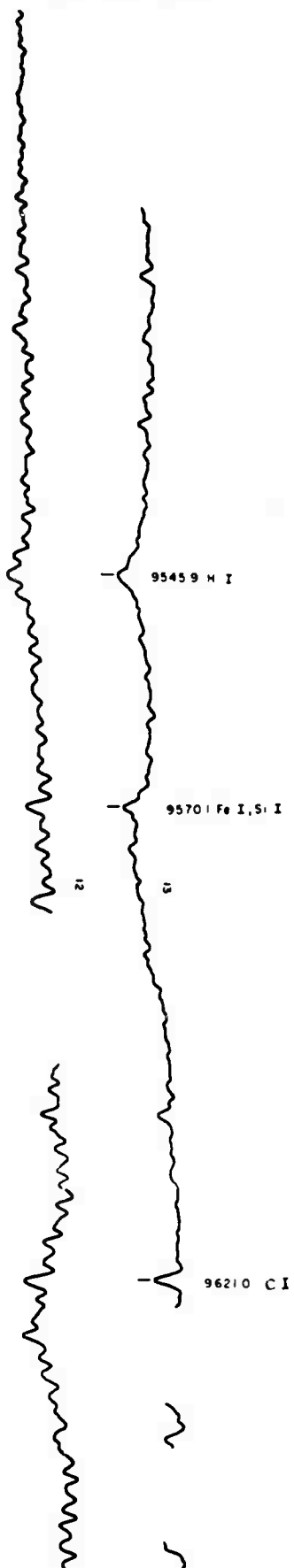


FIG 1 SEC 1



DEFLECTION



6

FIG 1 SEC 3

WAVELENGTH (Å)



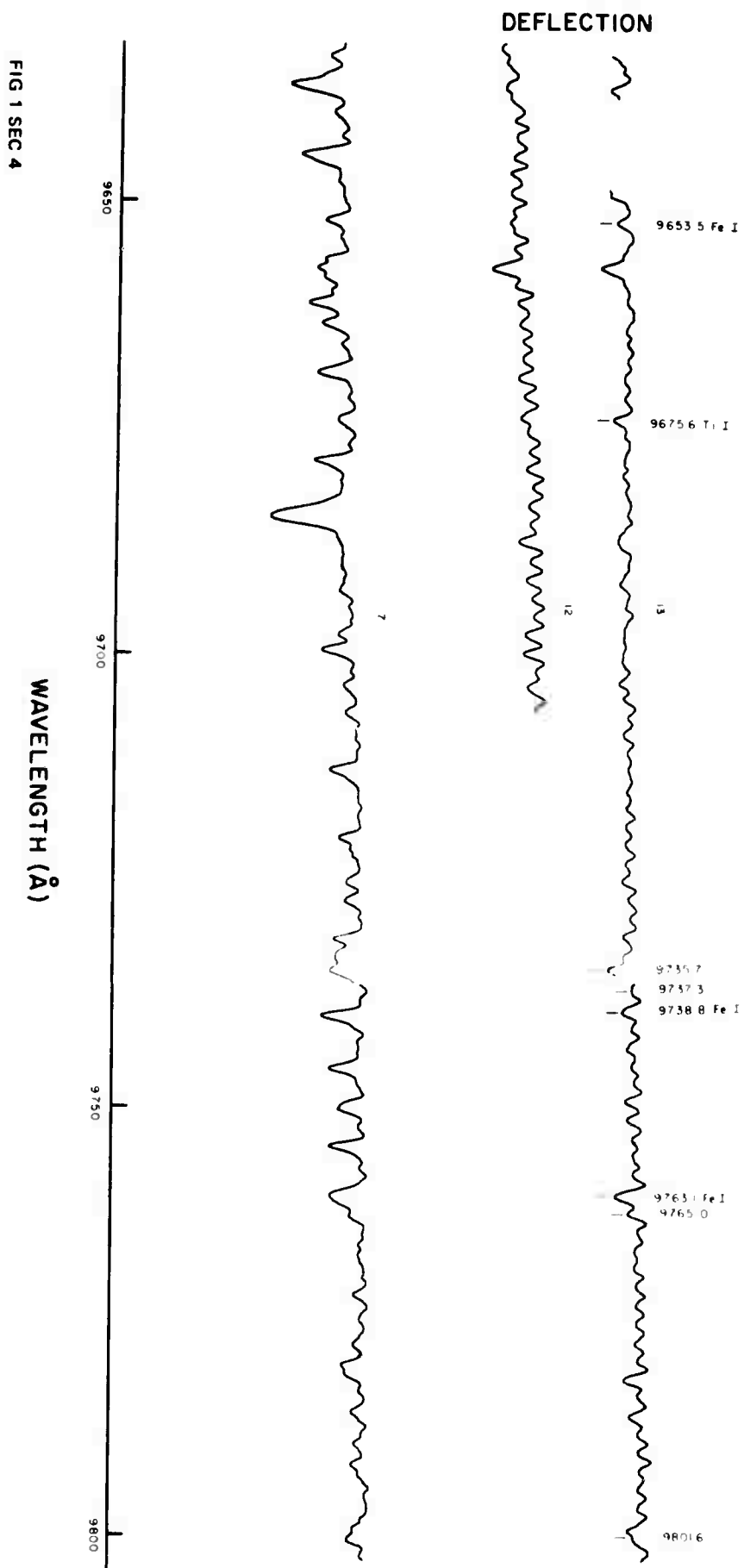


FIG 1 SEC 5

WAVELENGTH (Å)



DEFLECTION

9801.6

9861.7 Fe I

9889.1 Fe I
9891.6 Si I

DEFLECTION

FIG 1 SEC 6

WAVELENGTH (Å)

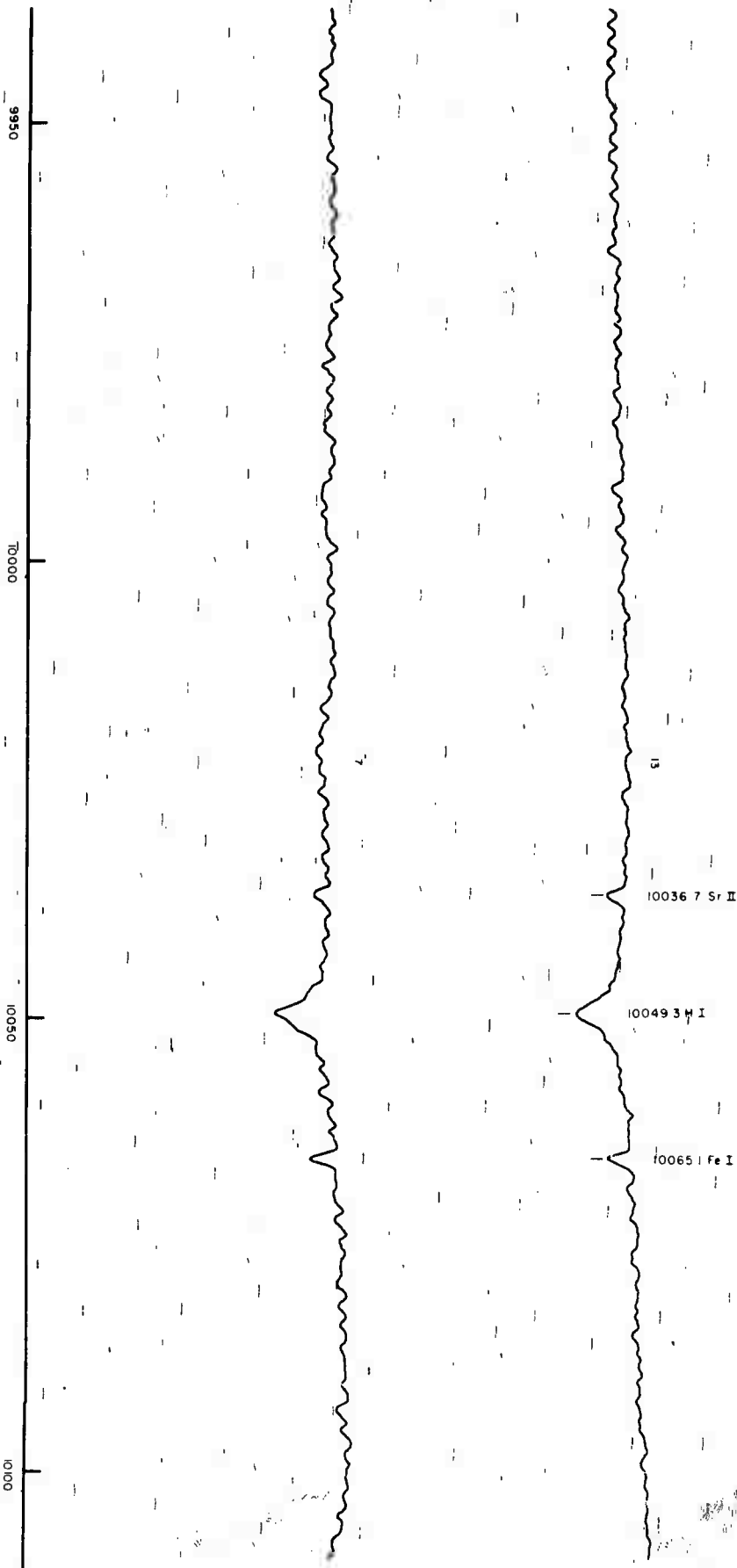
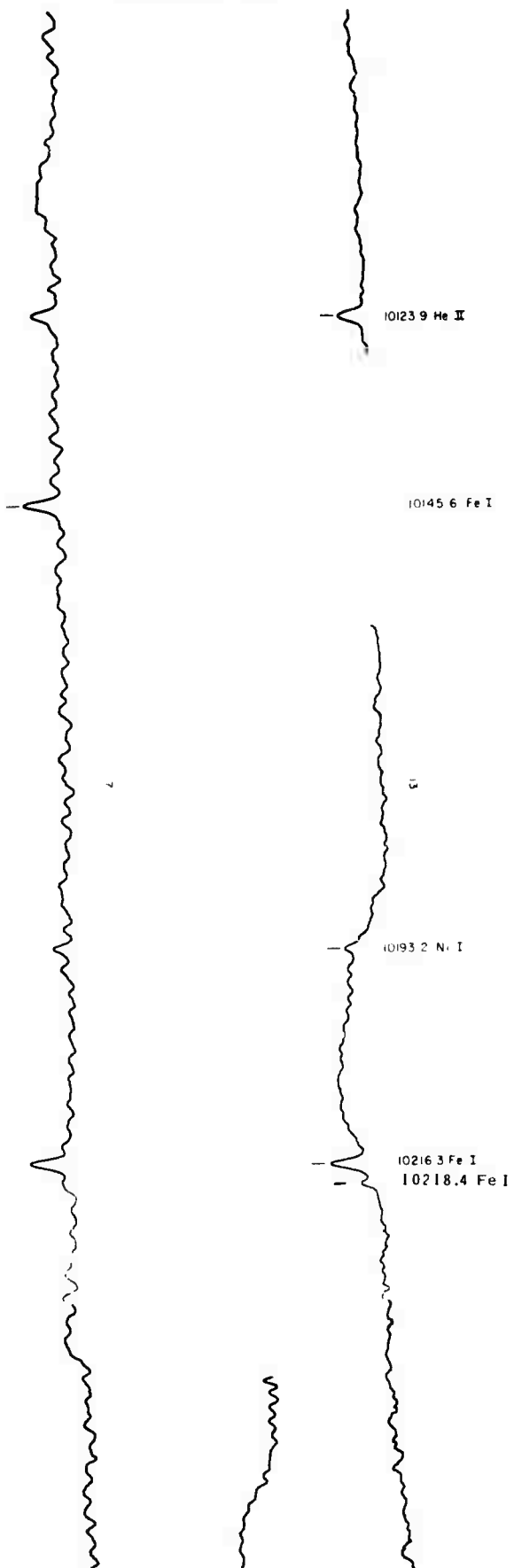


FIG 1 SEC 7

WAVELENGTH (Å)



DEFLECTION



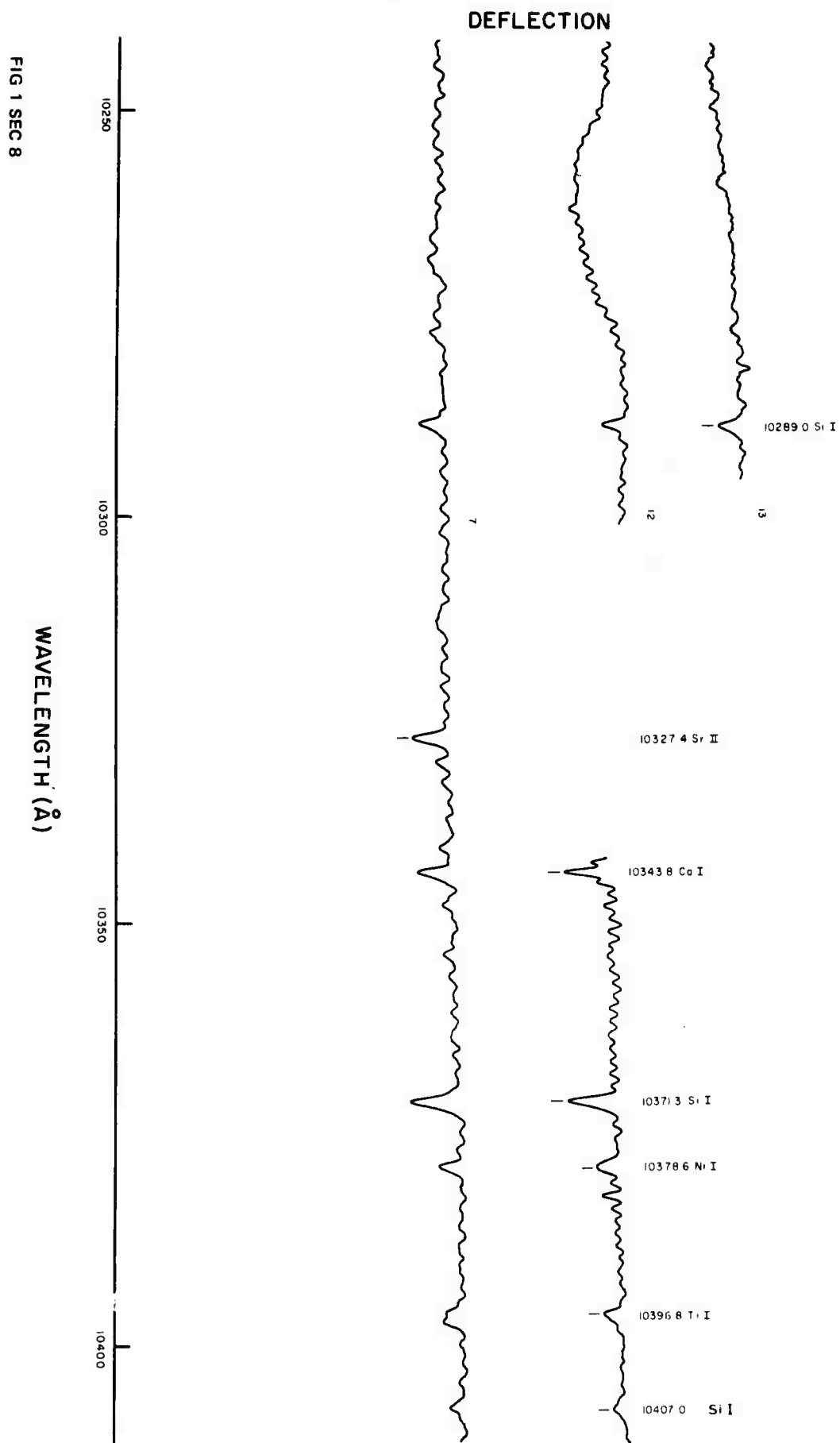
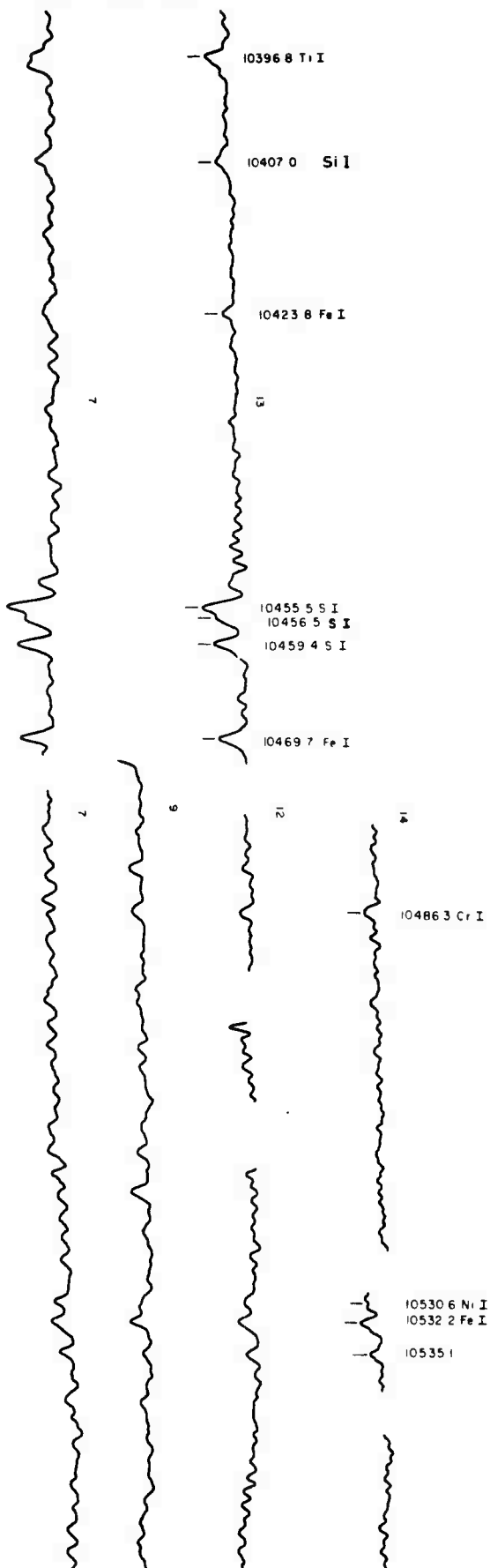


FIG 1 SEC 8

FIG 1 SEC 9

WAVELENGTH (\AA)

DEFLECTION



DEFLECTION

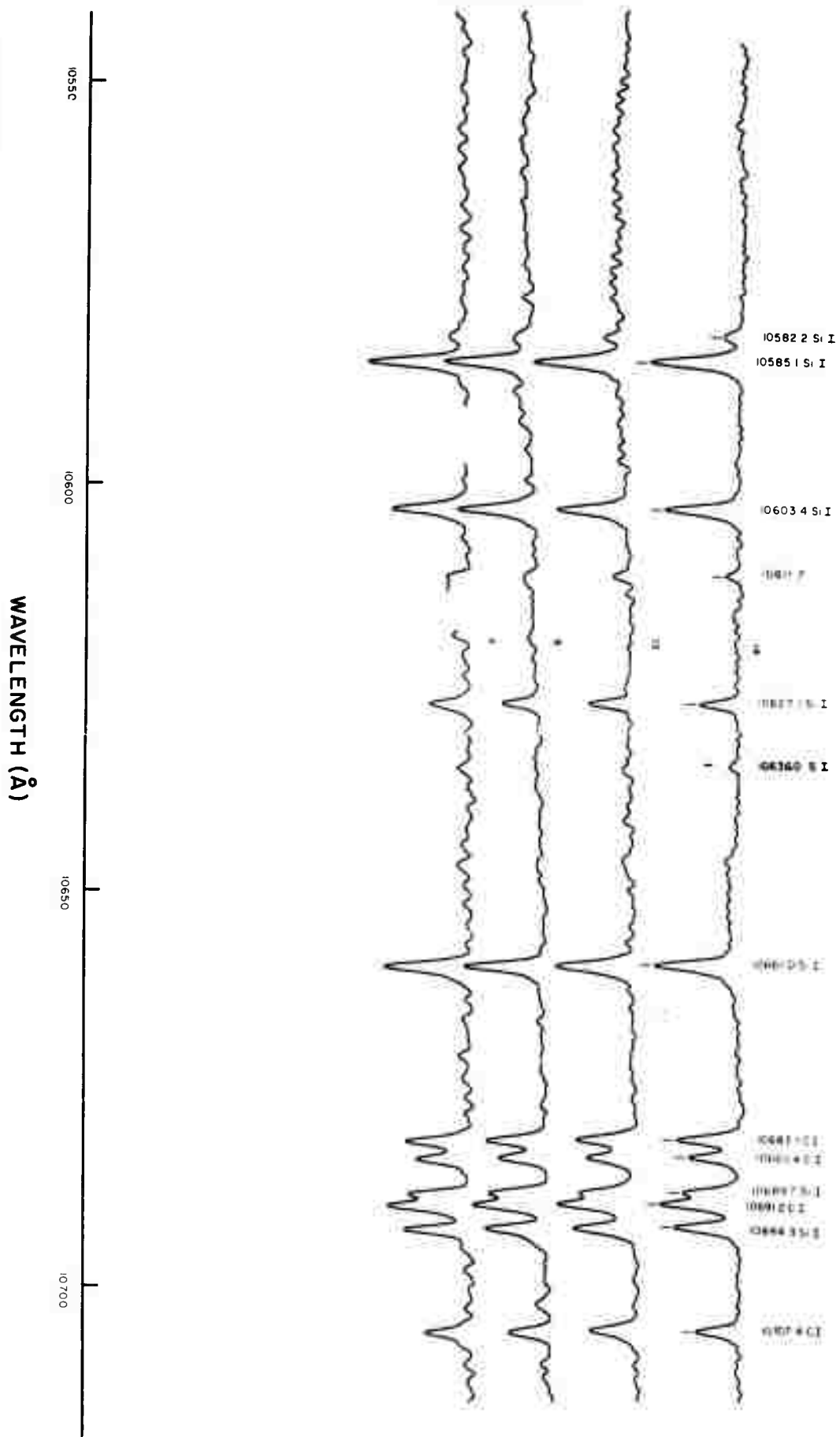
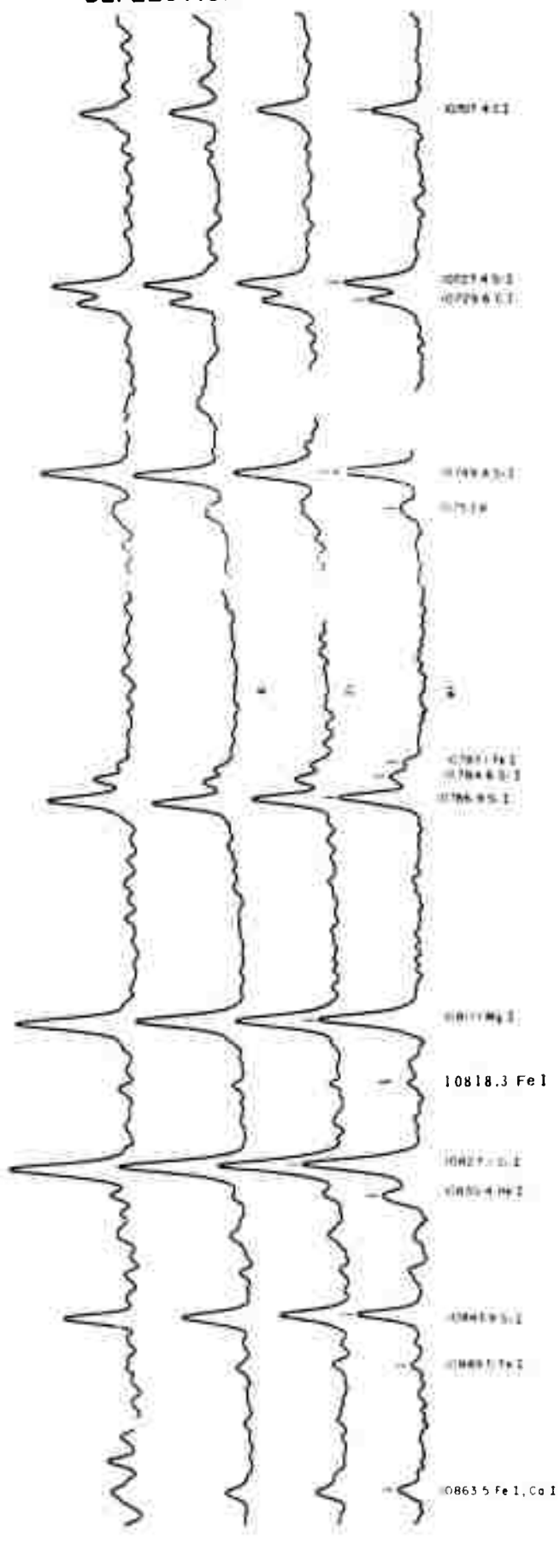
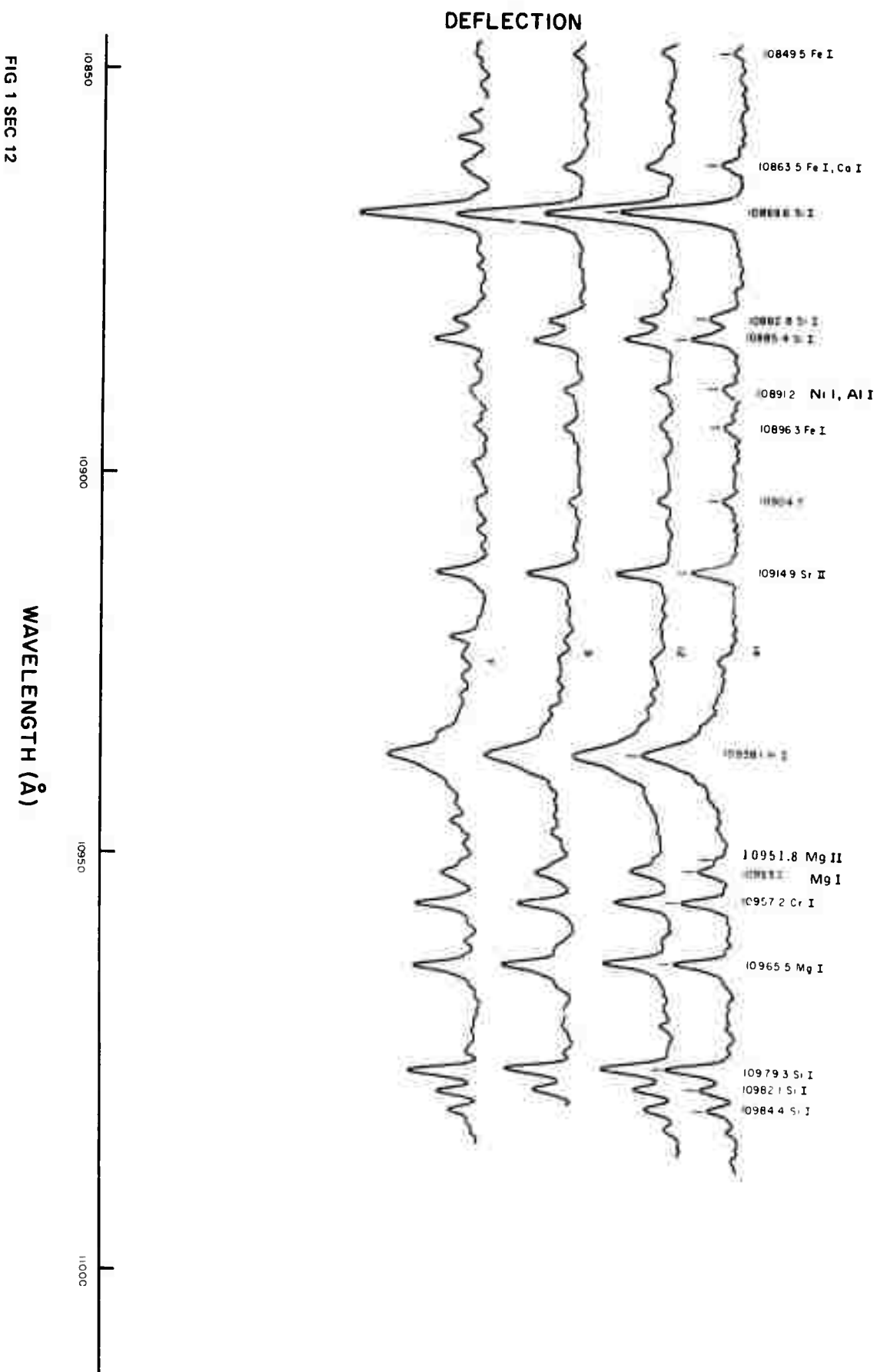


FIG 1 SEC 10

DEFLECTION



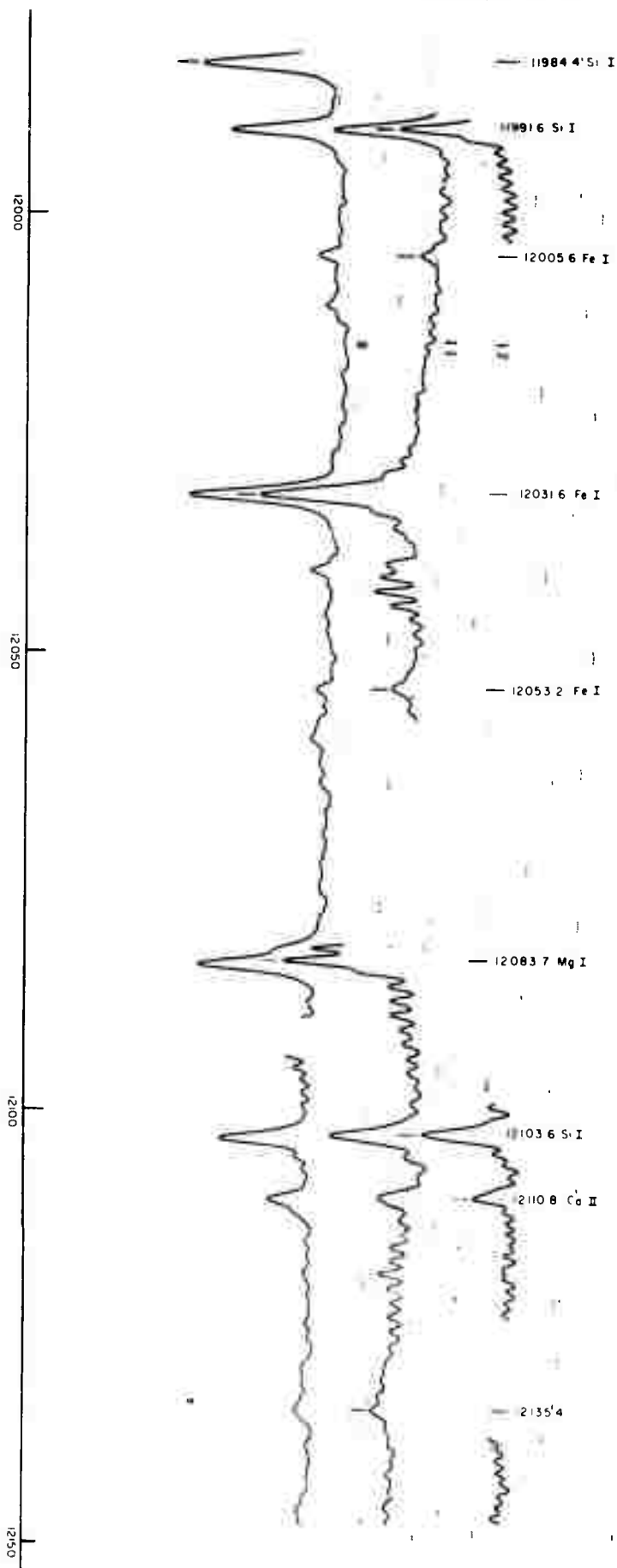
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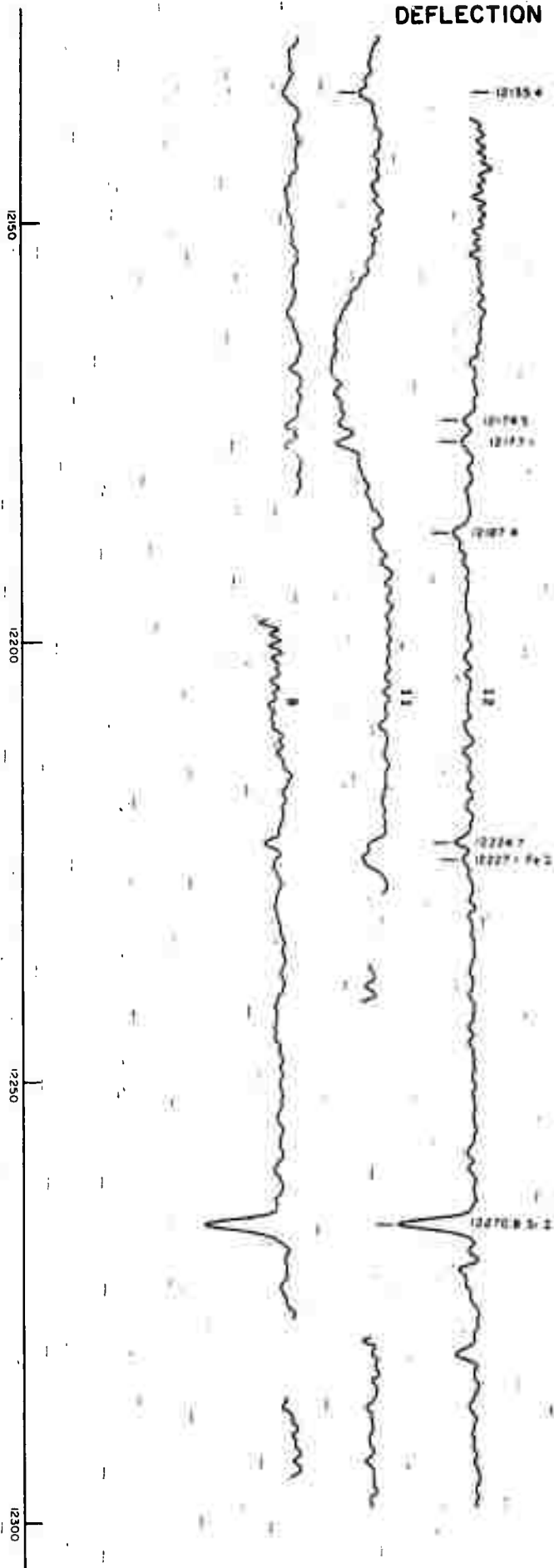
FIG 2 SEC 1

WAVELENGTH (Å)

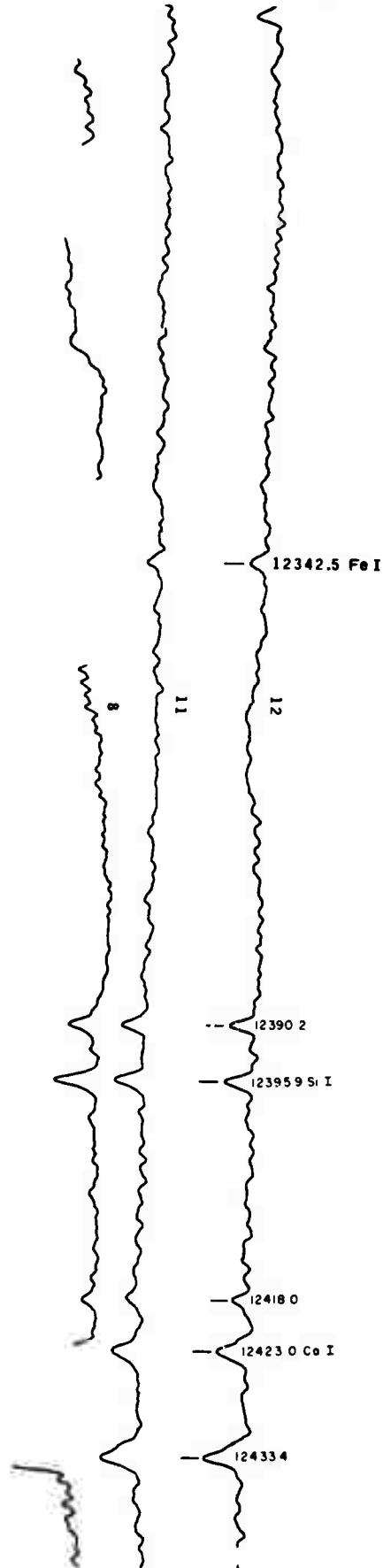


DEFLECTION

FIG 2 SEC 2

WAVELENGTH (\AA)

DEFLECTION



18

FIG 2 SEC 3

WAVELENGTH (Å)

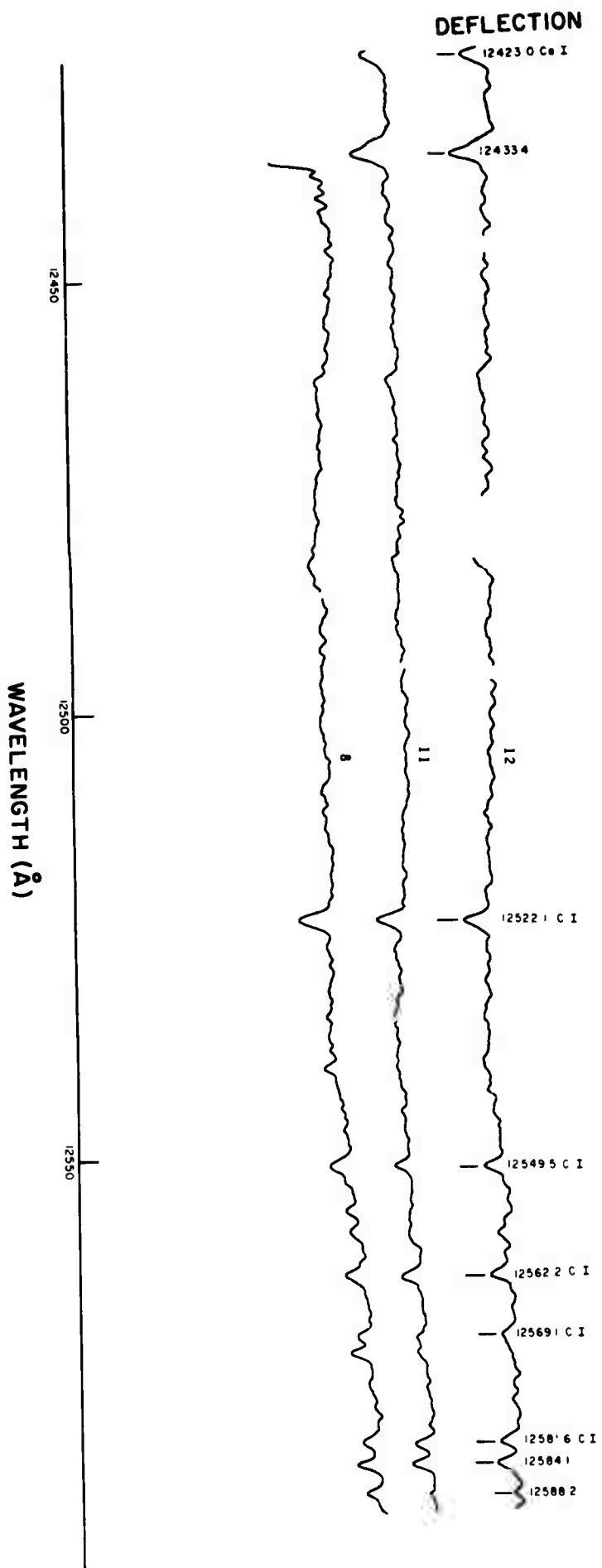


FIG 2 SEC 4

FIG 2 SEC 5

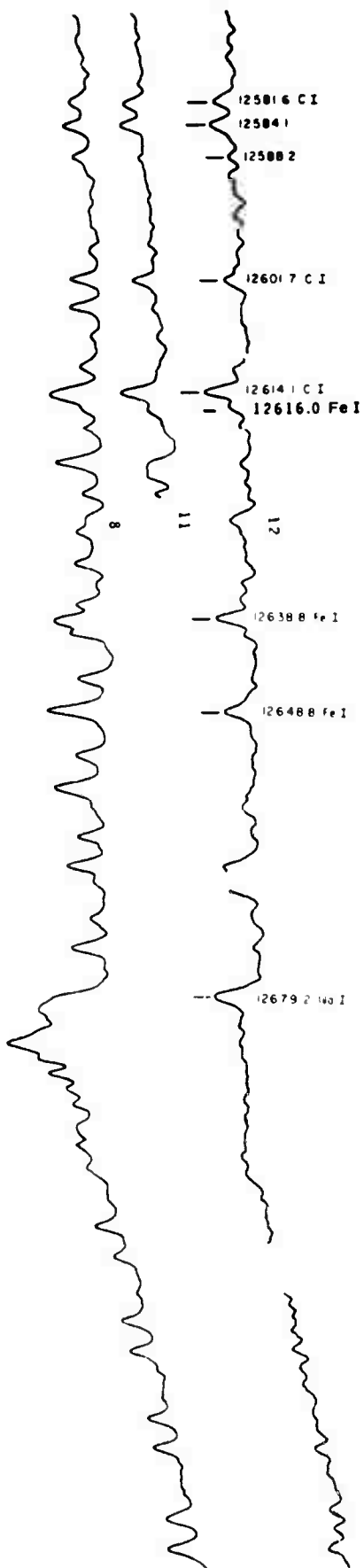
WAVELENGTH (Å)

12600

12650

12700

DEFLECTION



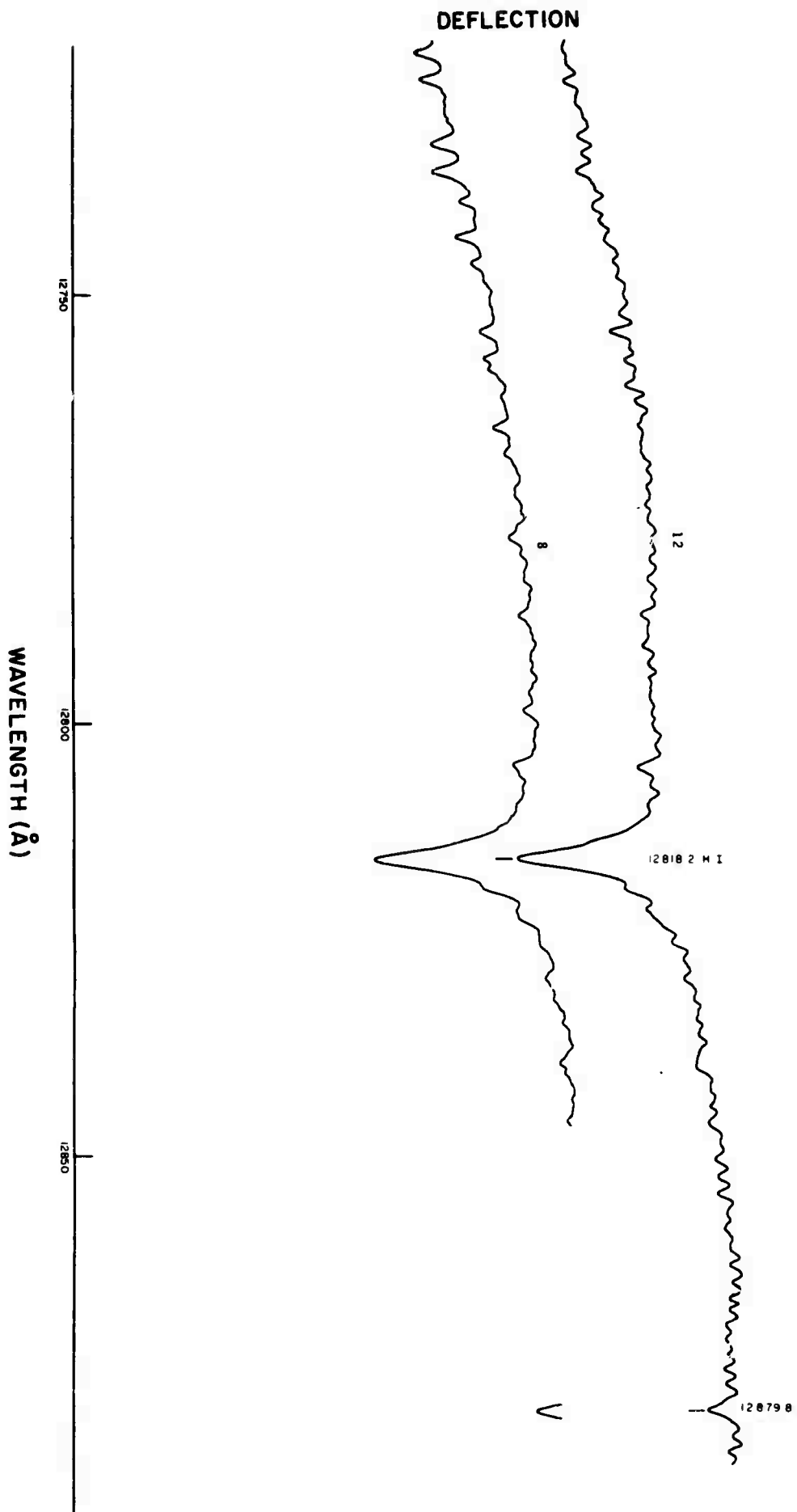
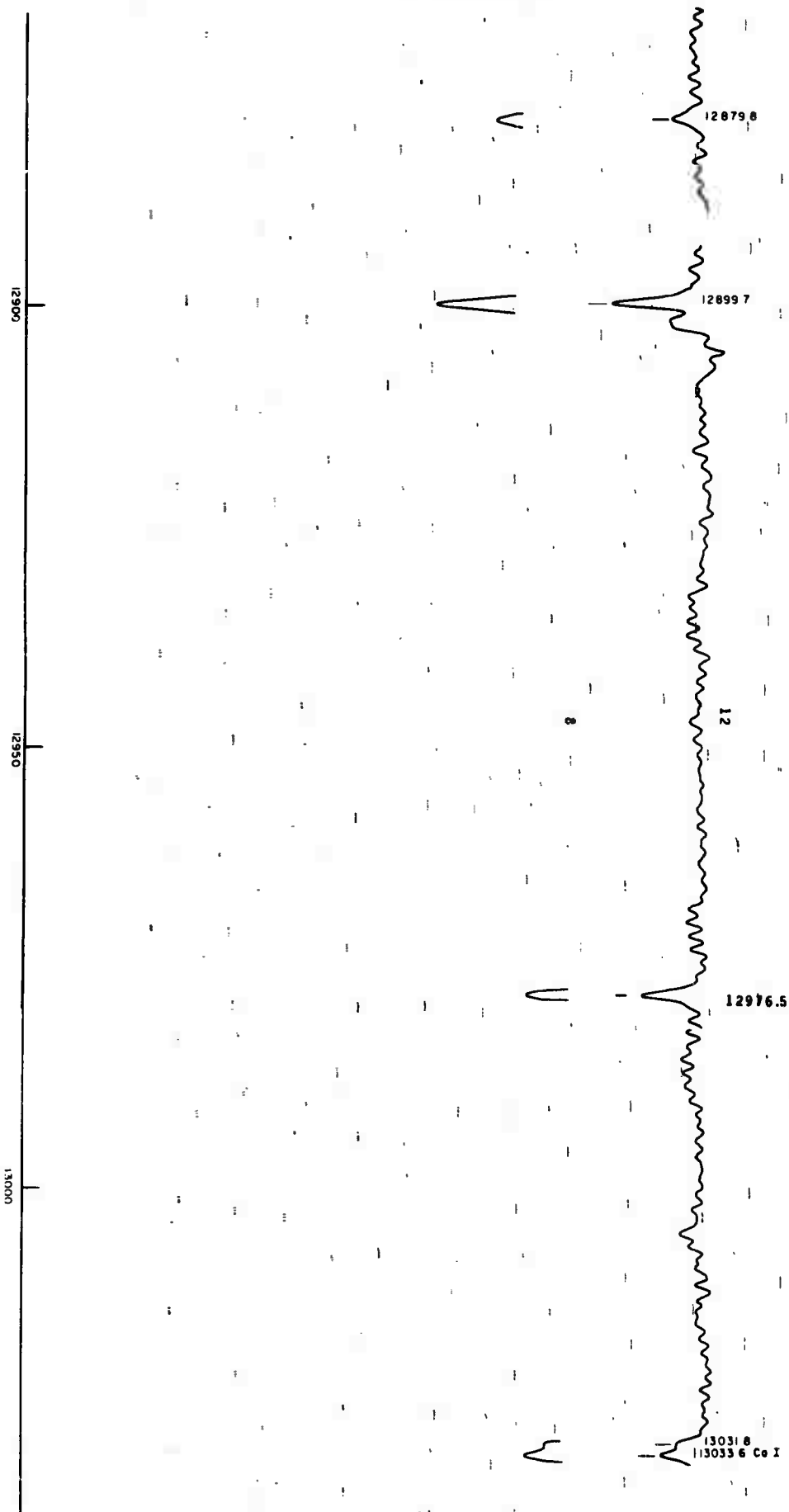


FIG 2 SEC 6

DEFLECTION

FIG 2 SEC 7

WAVELENGTH (Å)

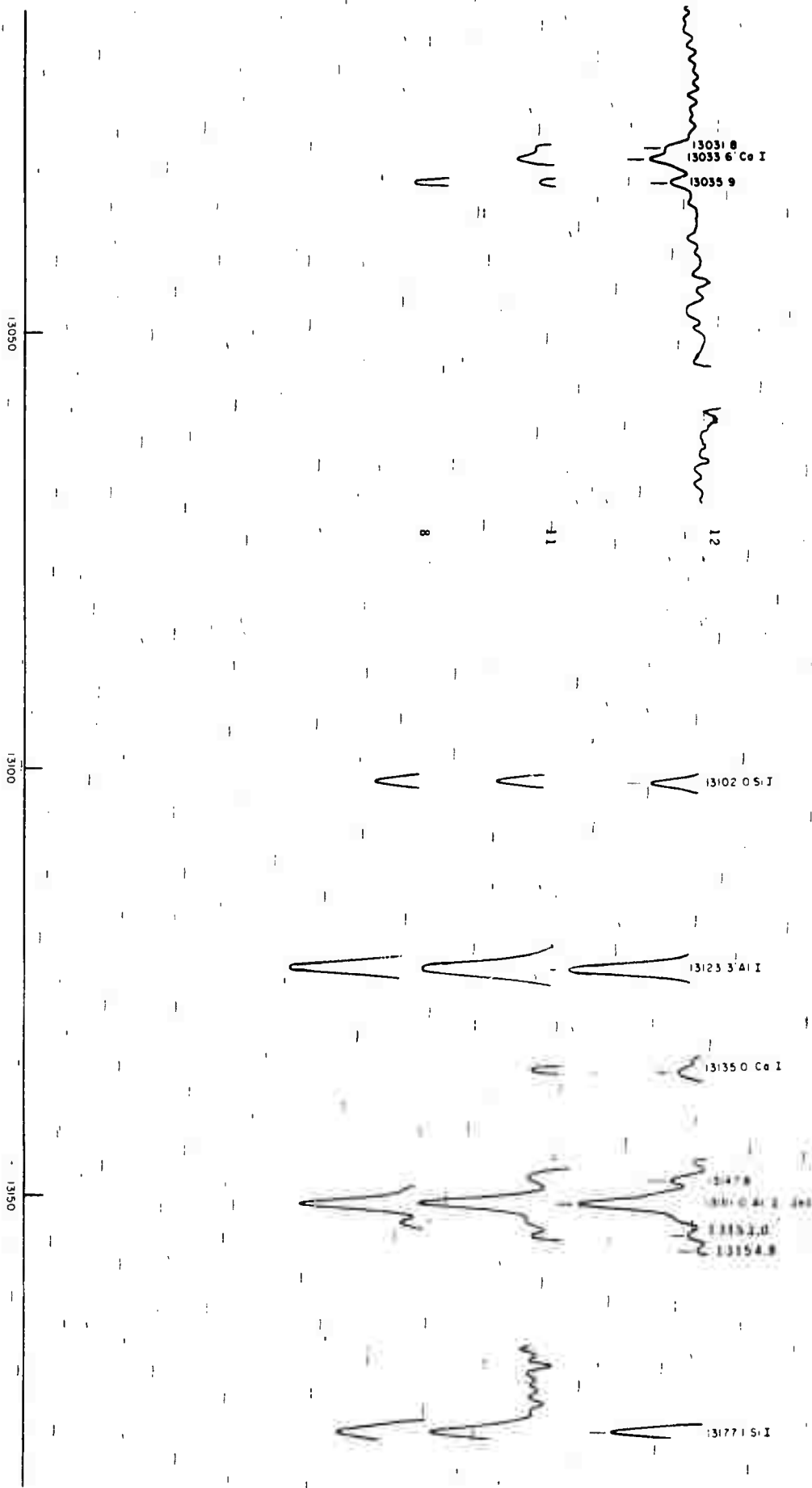


DEFLECTION

23

FIG 2 SEC 8

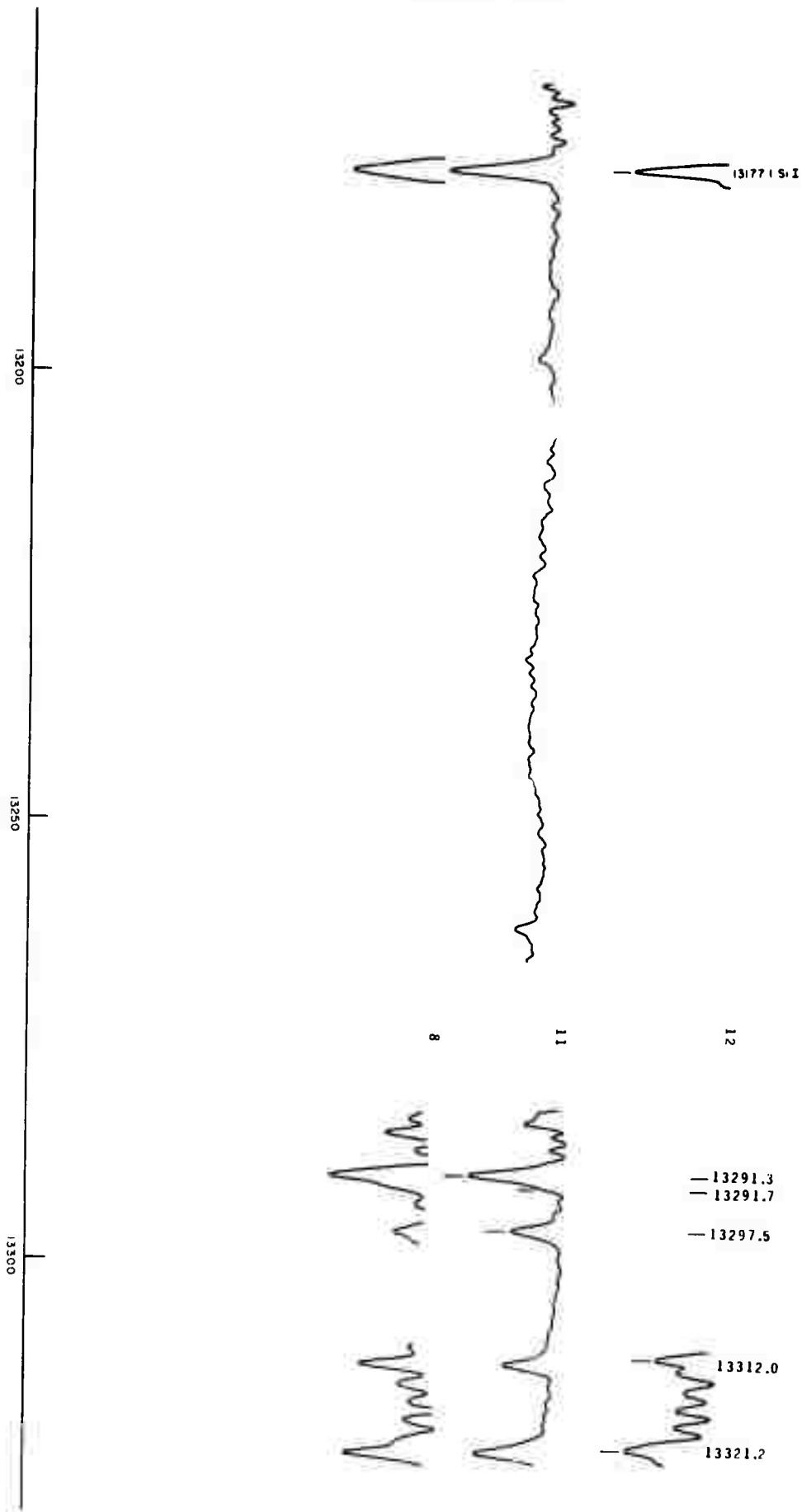
WAVELENGTH (Å)



DEFLECTION

FIG 2 SEC 9

WAVELENGTH (Å)



DEFLECTION

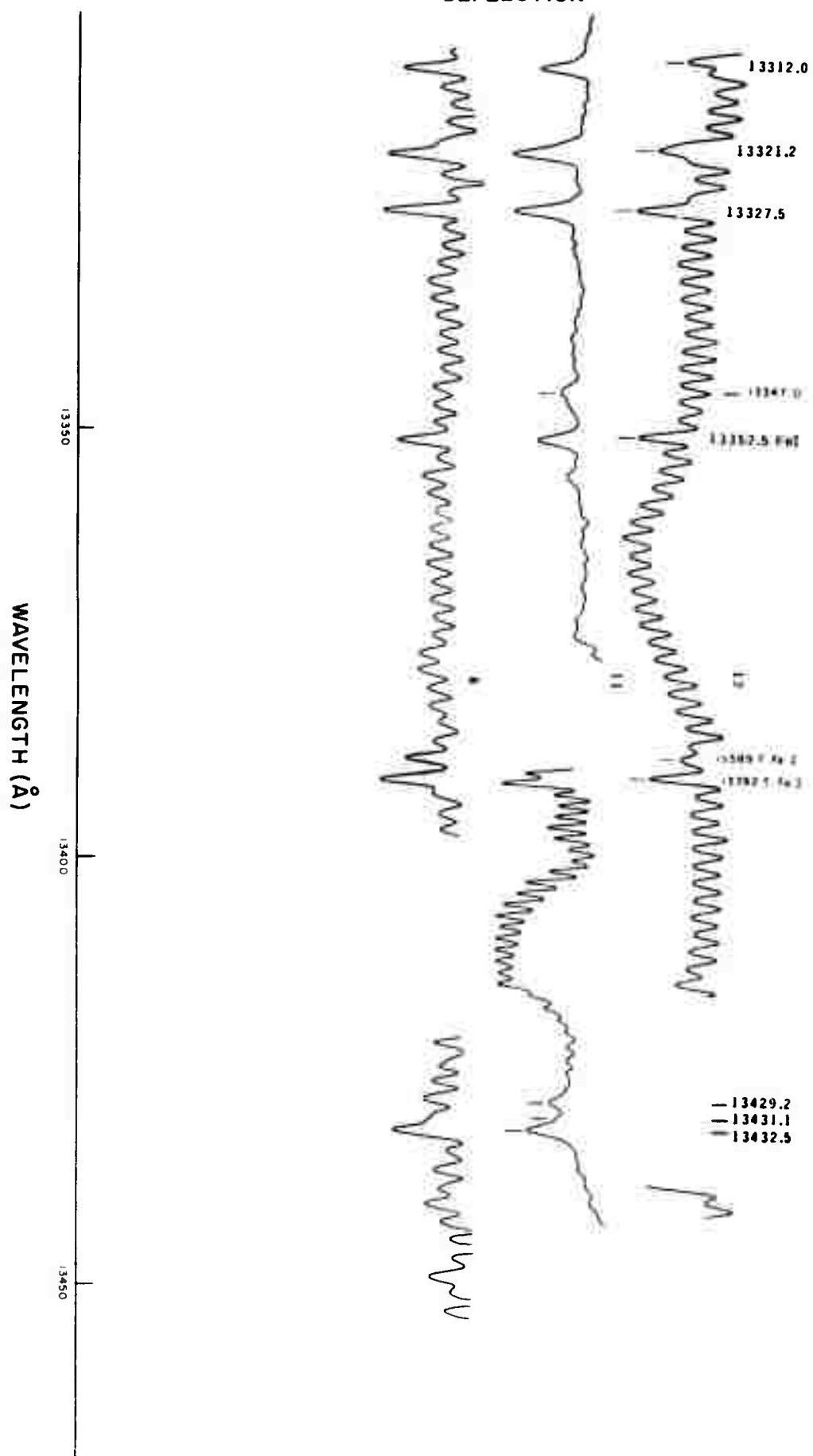


FIG 2 SEC 10

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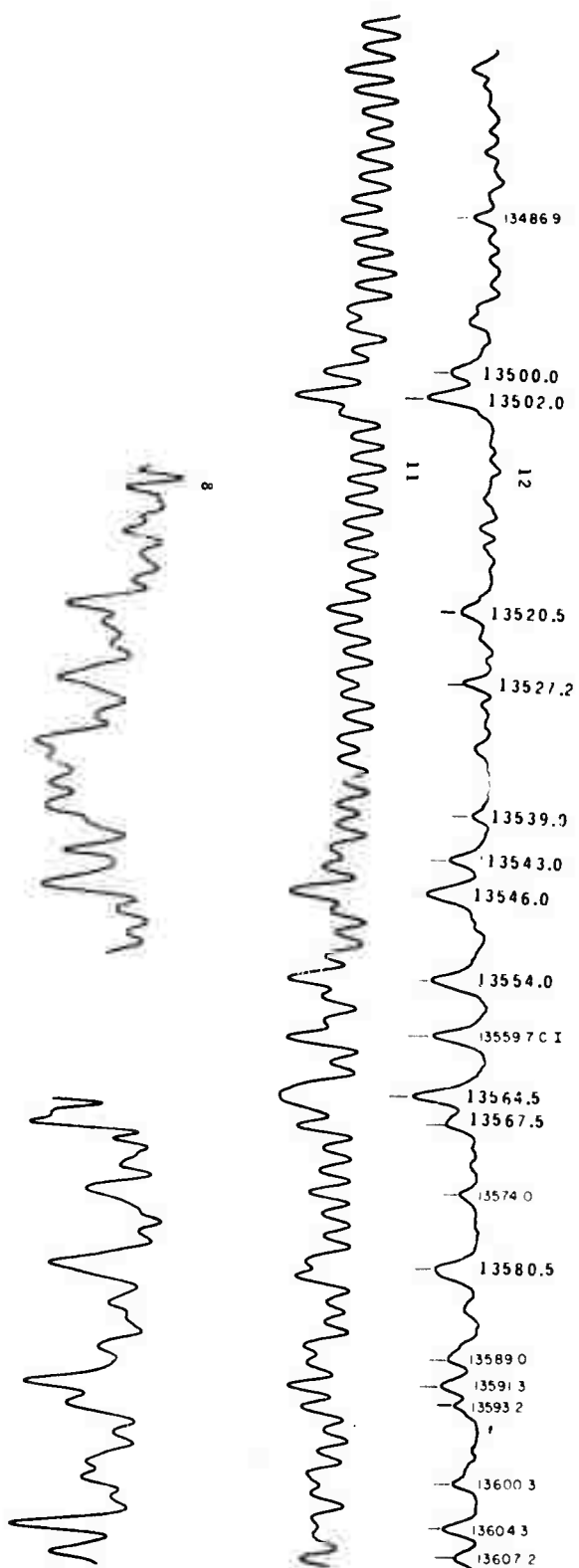


FIG 2 SEC 11

WAVELENGTH (Å)



DEFLECTION

FIG 2 SEC 12

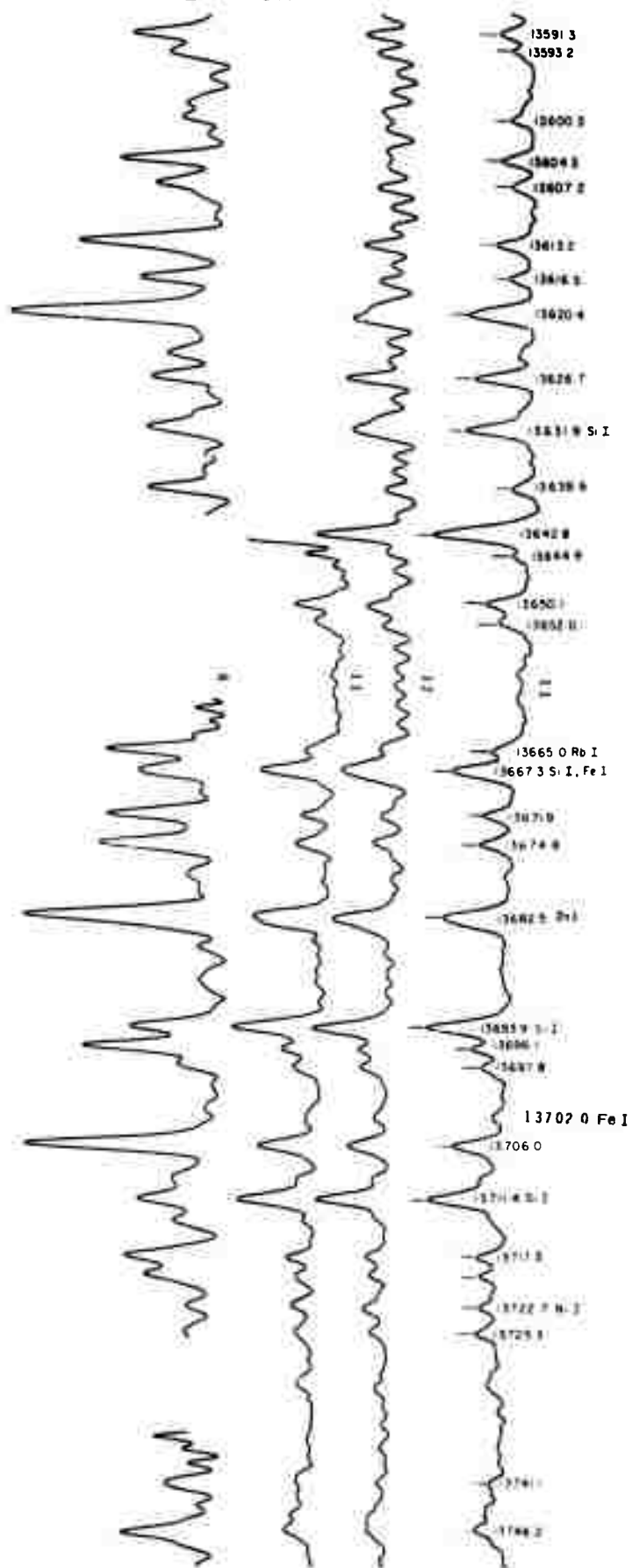
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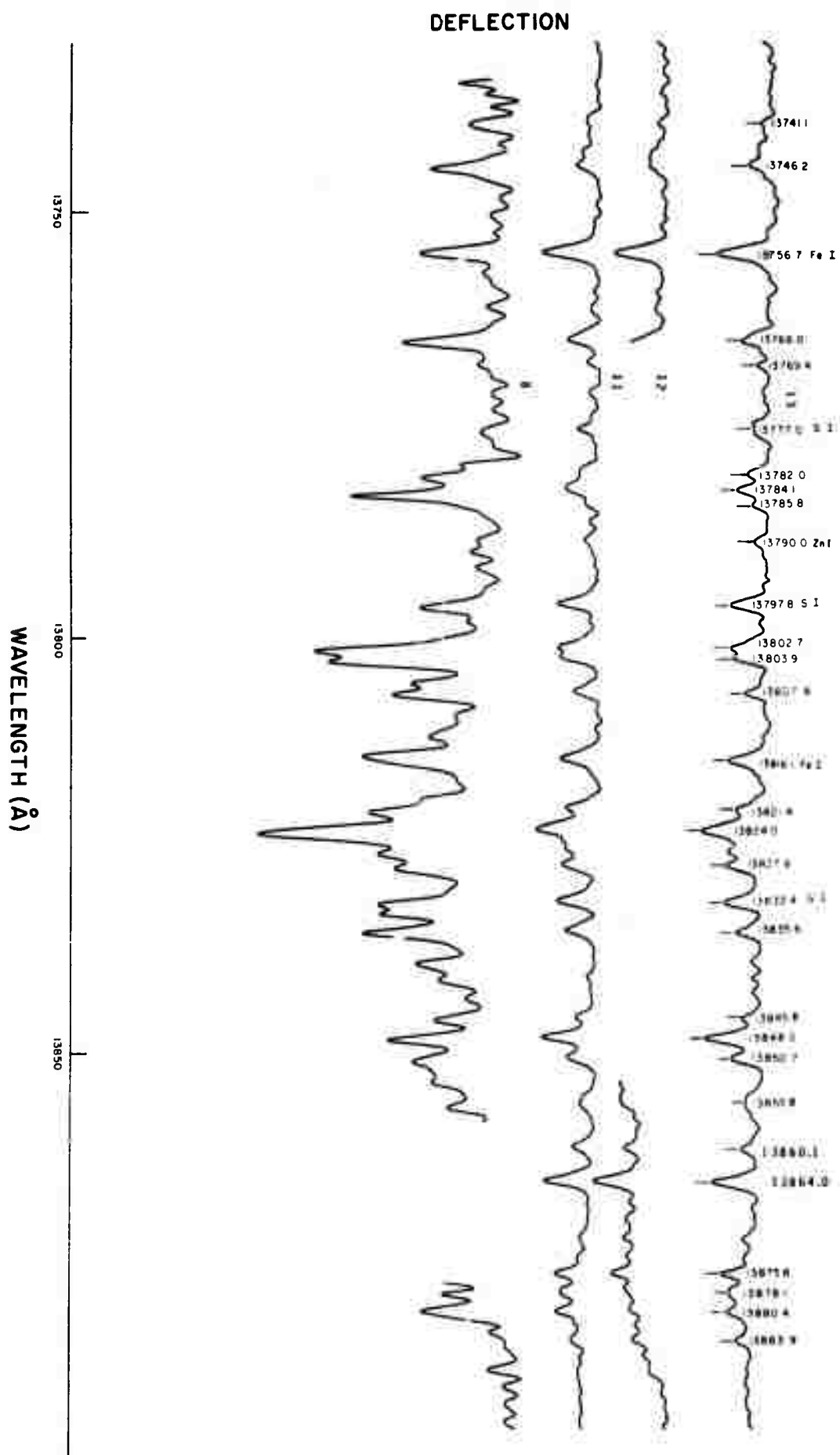
13600

13650

13700

13750





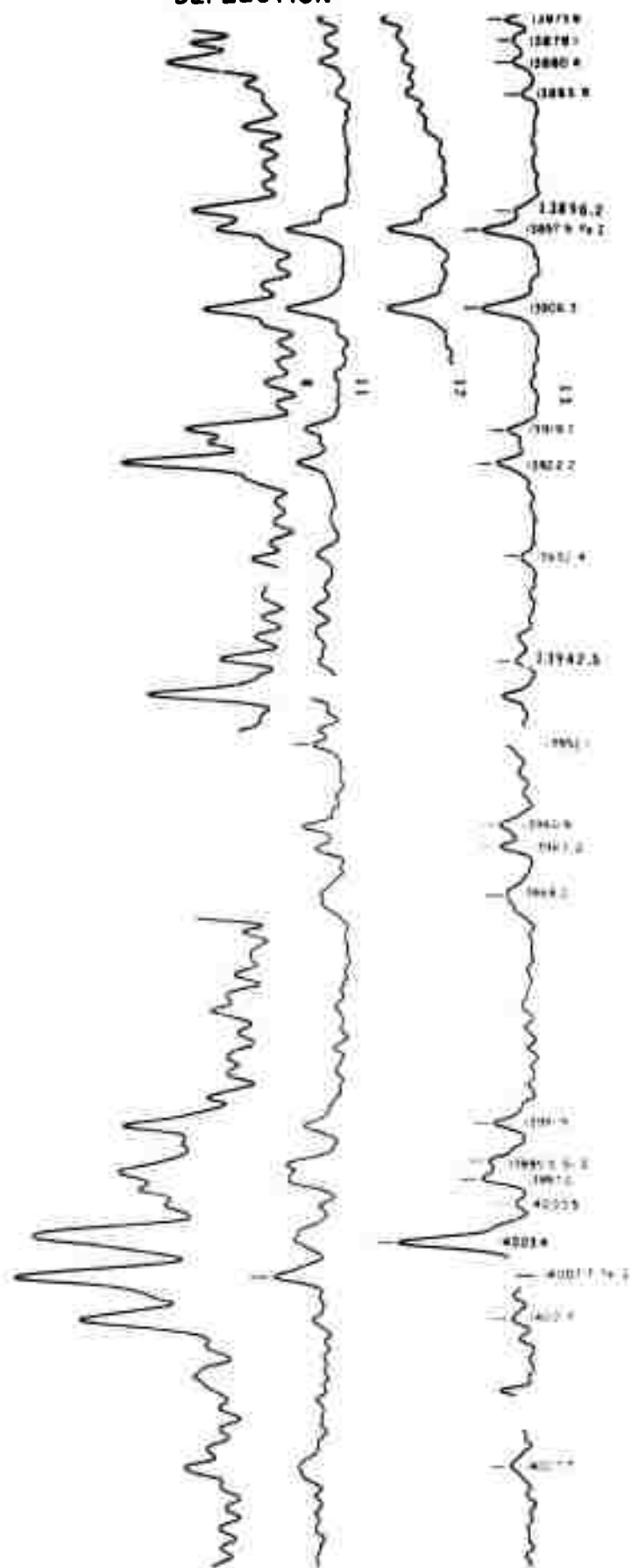


FIG 2 SEC 14

WAVELENGTH (Å)

FIG 2 SEC 15

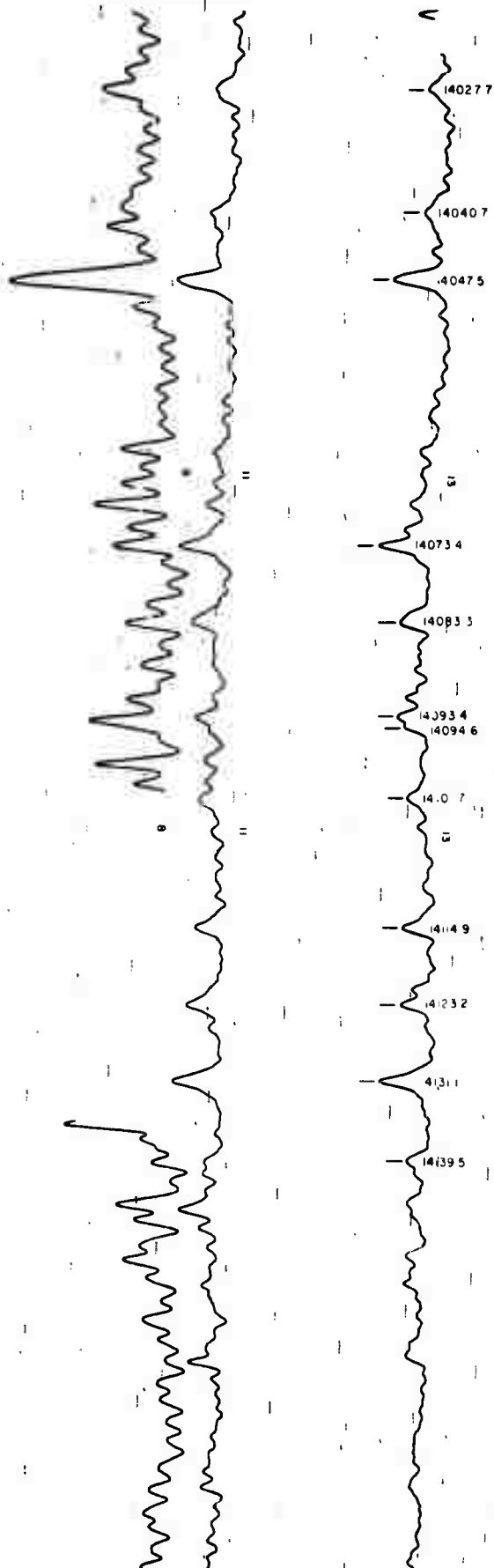
WAVELENGTH (Å)

14050

14100

14150

DEFLECTION



DEFLECTION

FIG 2 SEC 16

WAVELENGTH (Å)

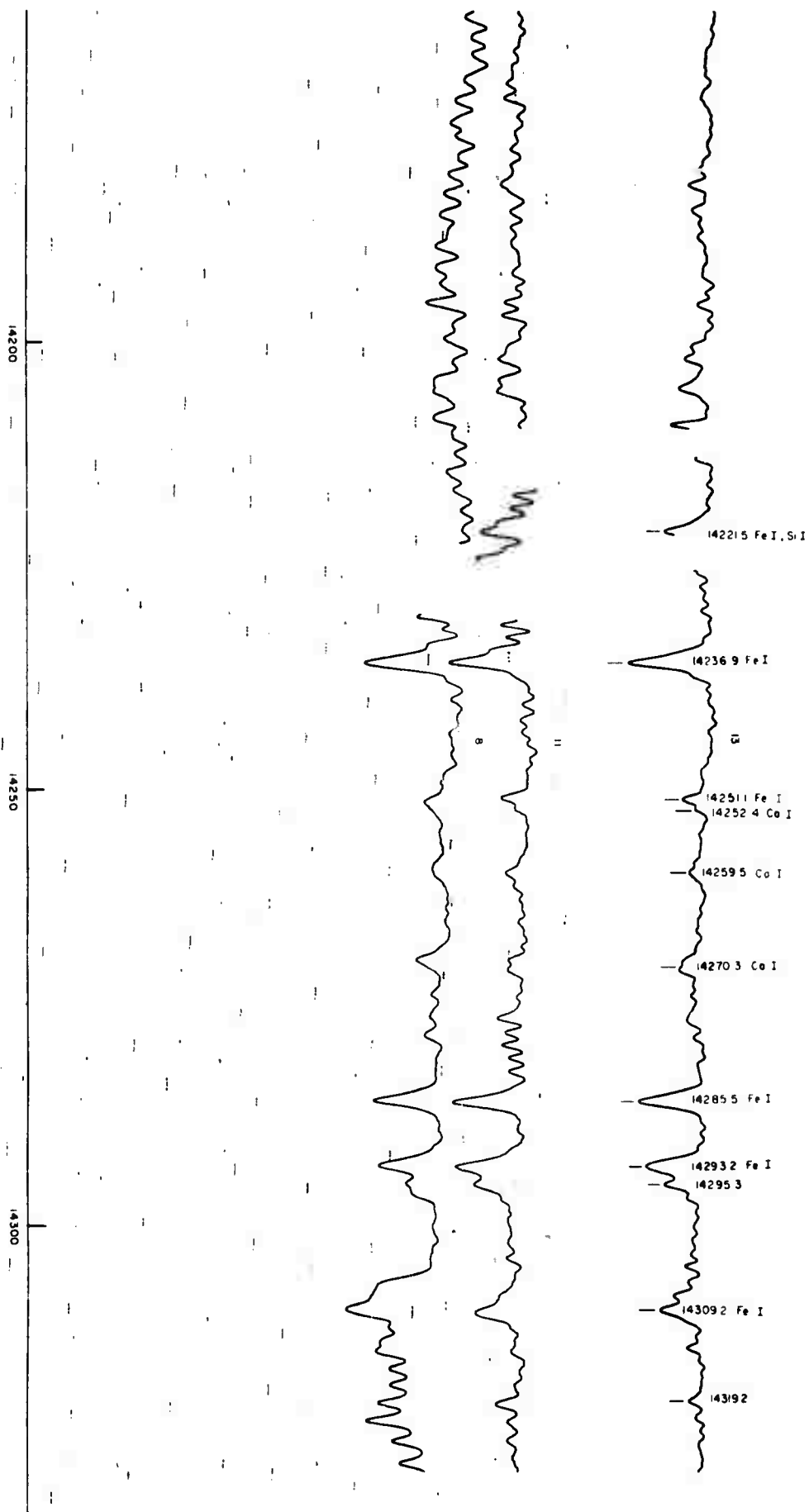
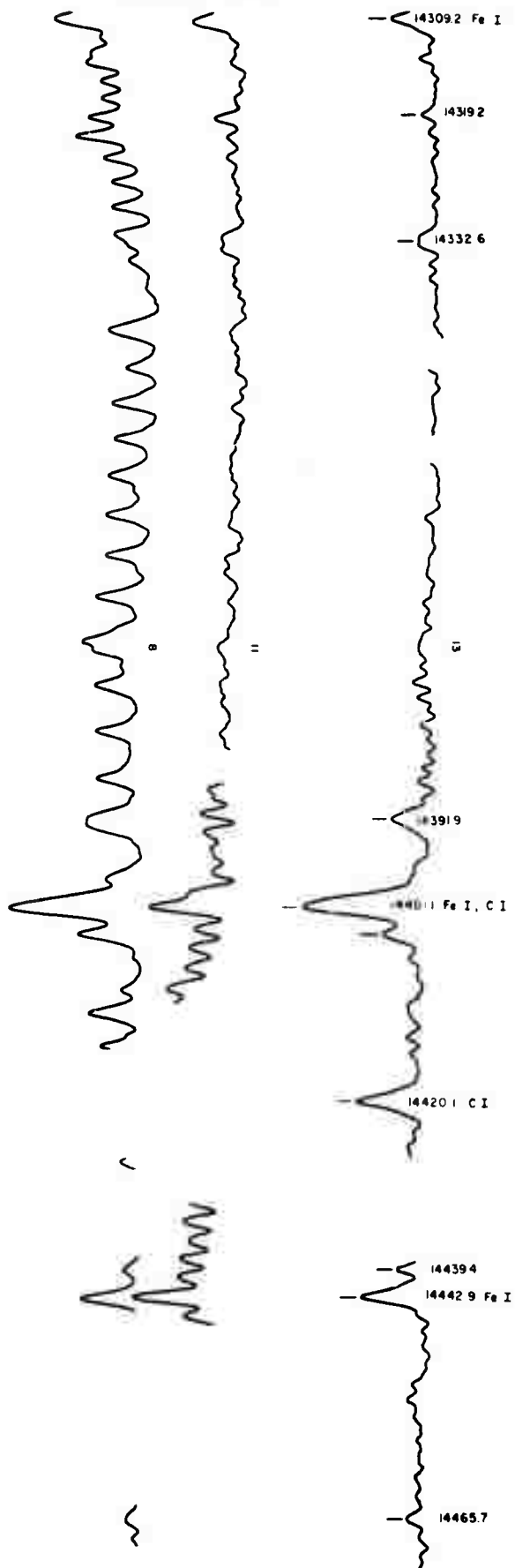


FIG 2 SEC 17

WAVELENGTH (\AA)

DEFLECTION



DEFLECTION

FIG 2 SEC 18

WAVELENGTH (Å)

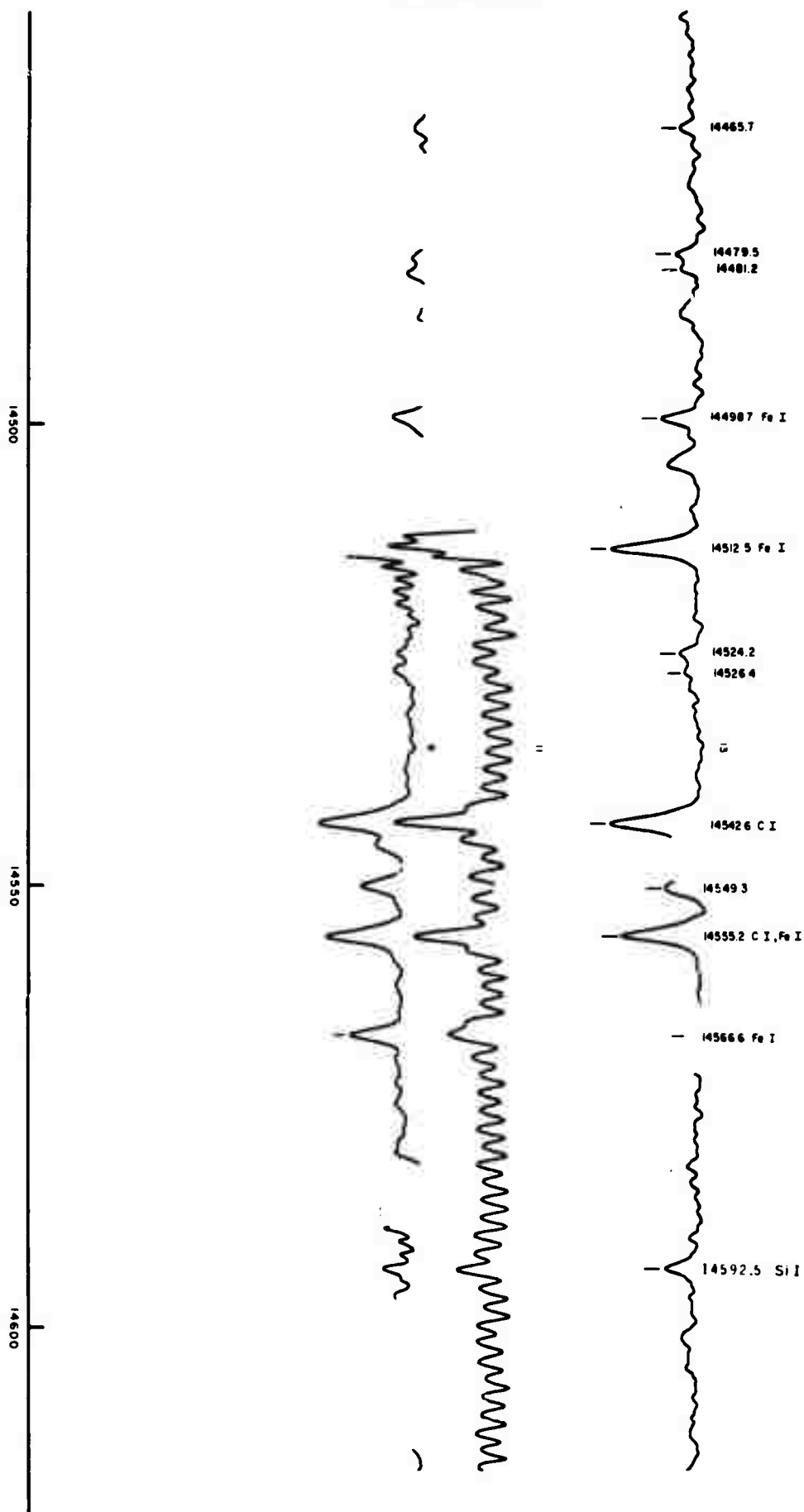
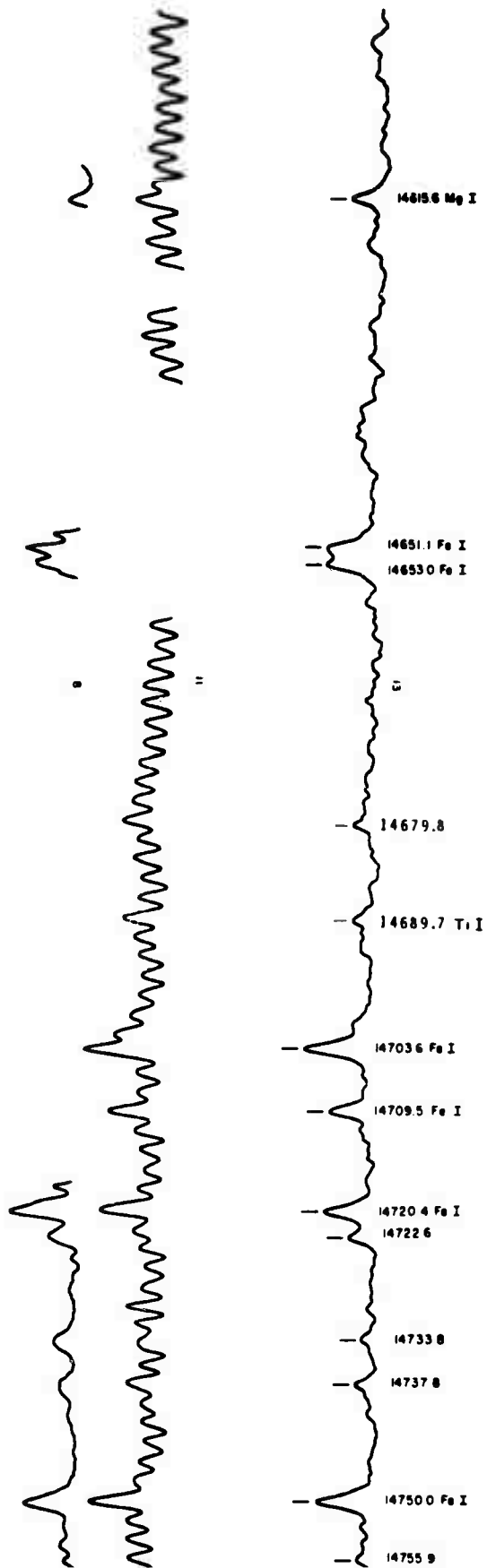


FIG 2 SEC 19

WAVELENGTH (Å)



DEFLECTION



DEFLECTION

FIG 2 SEC 20

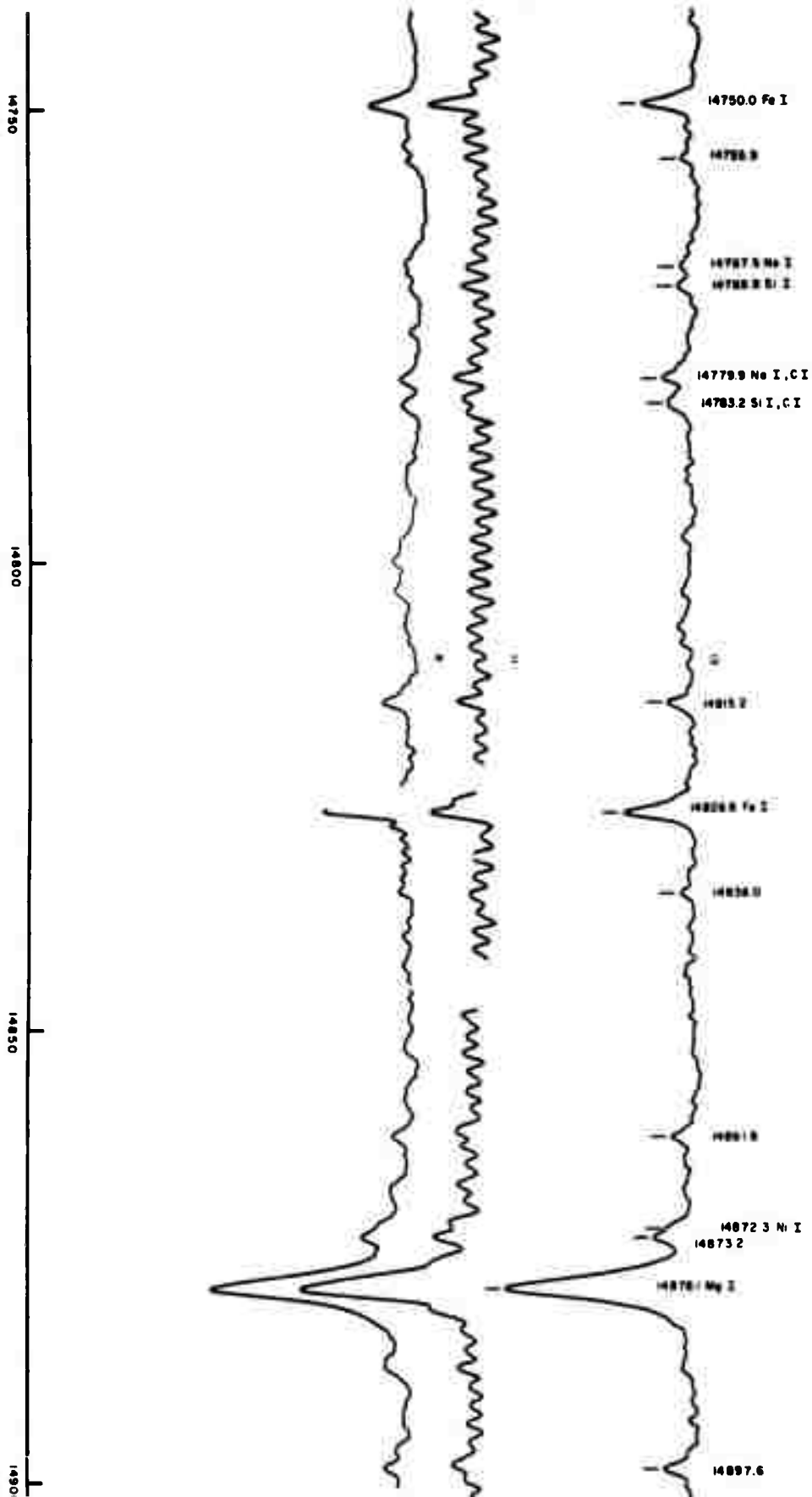
WAVELENGTH (\AA)

FIG 2 SEC 21

WAVELENGTH (Å)

14900

14950

15000

15050

DEFLECTION

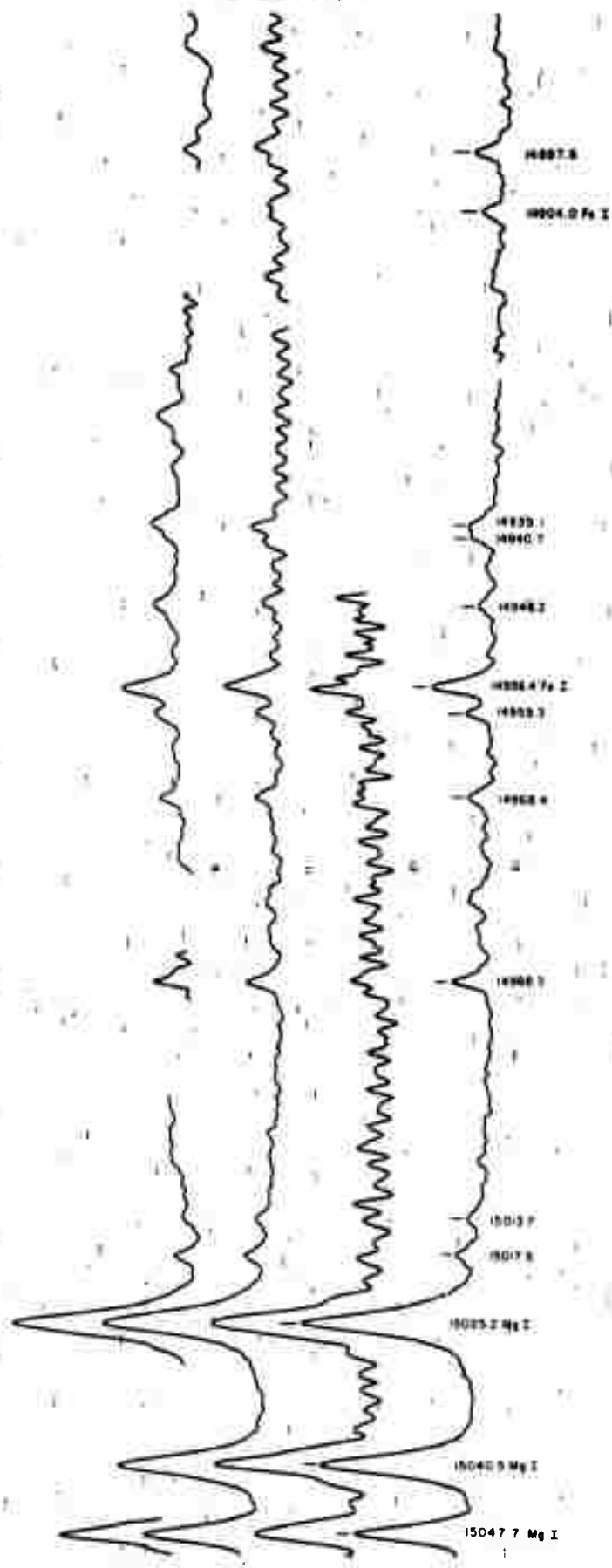


FIG 2 SEC 22

WAVELENGTH (Å)

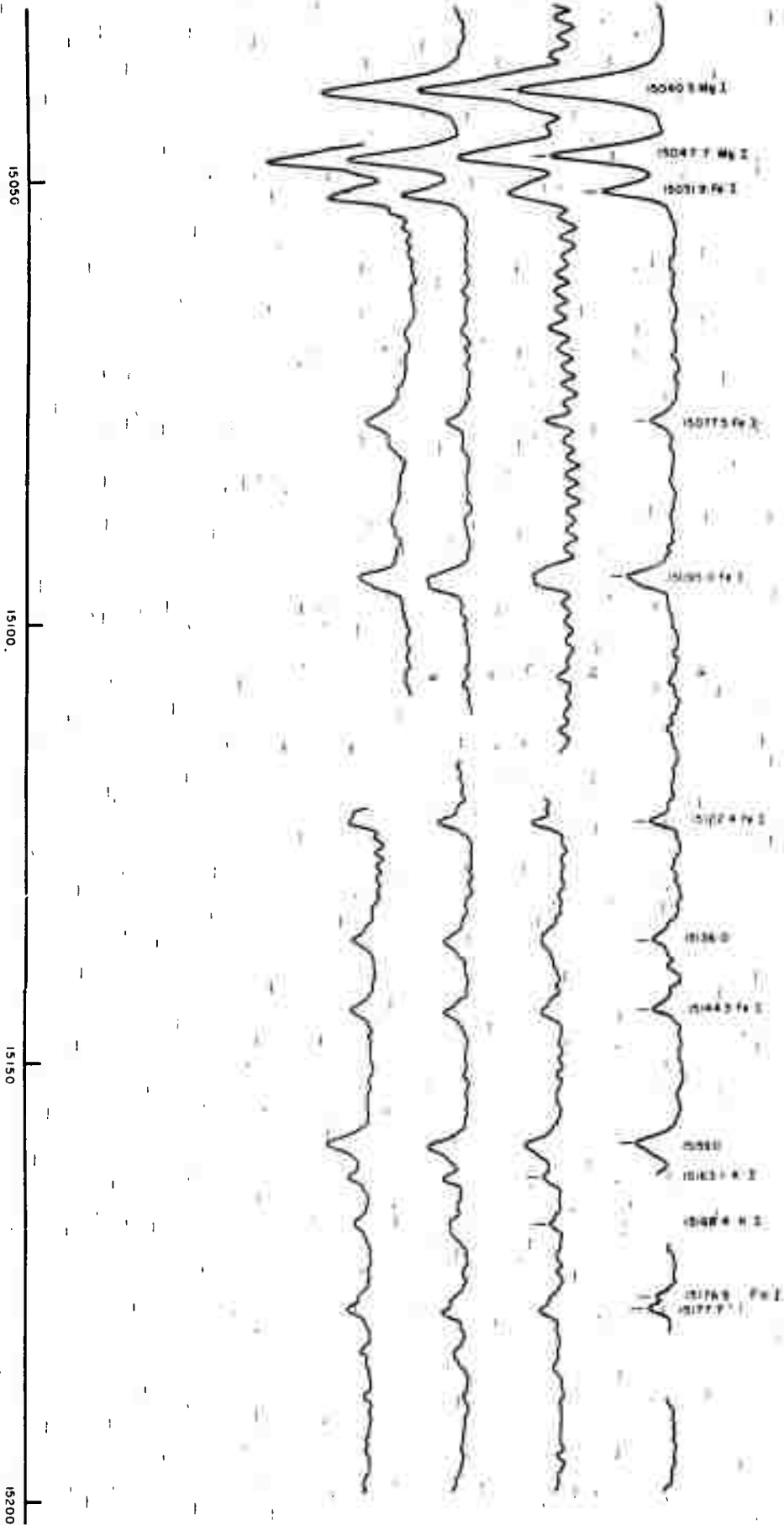
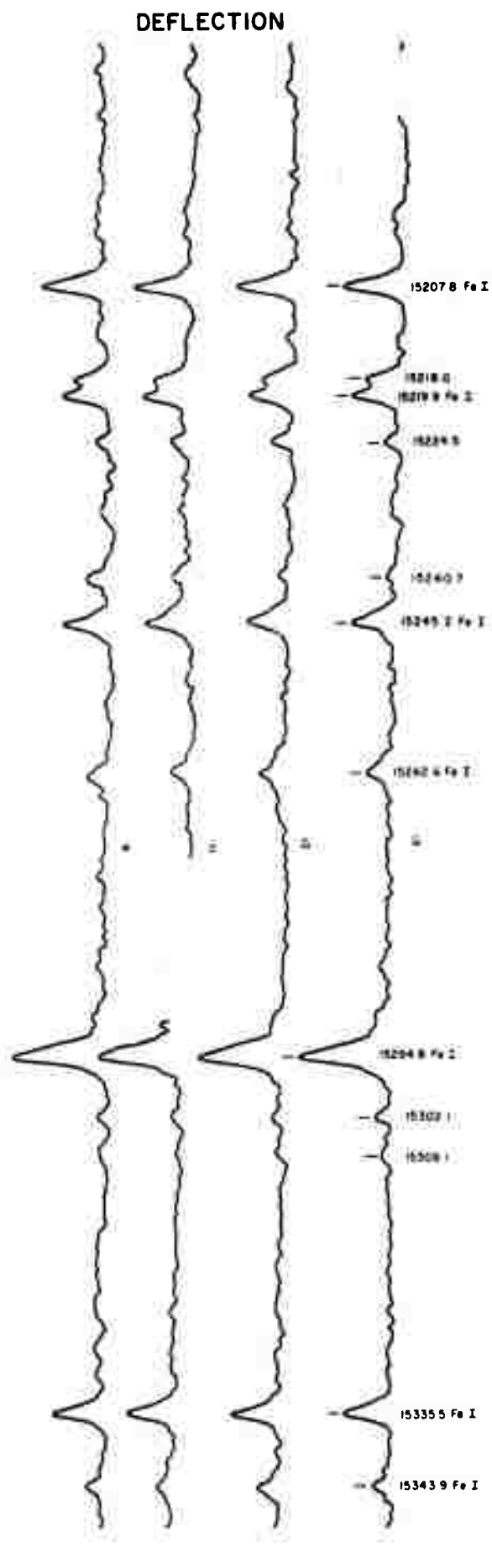


FIG 2 SEC 23



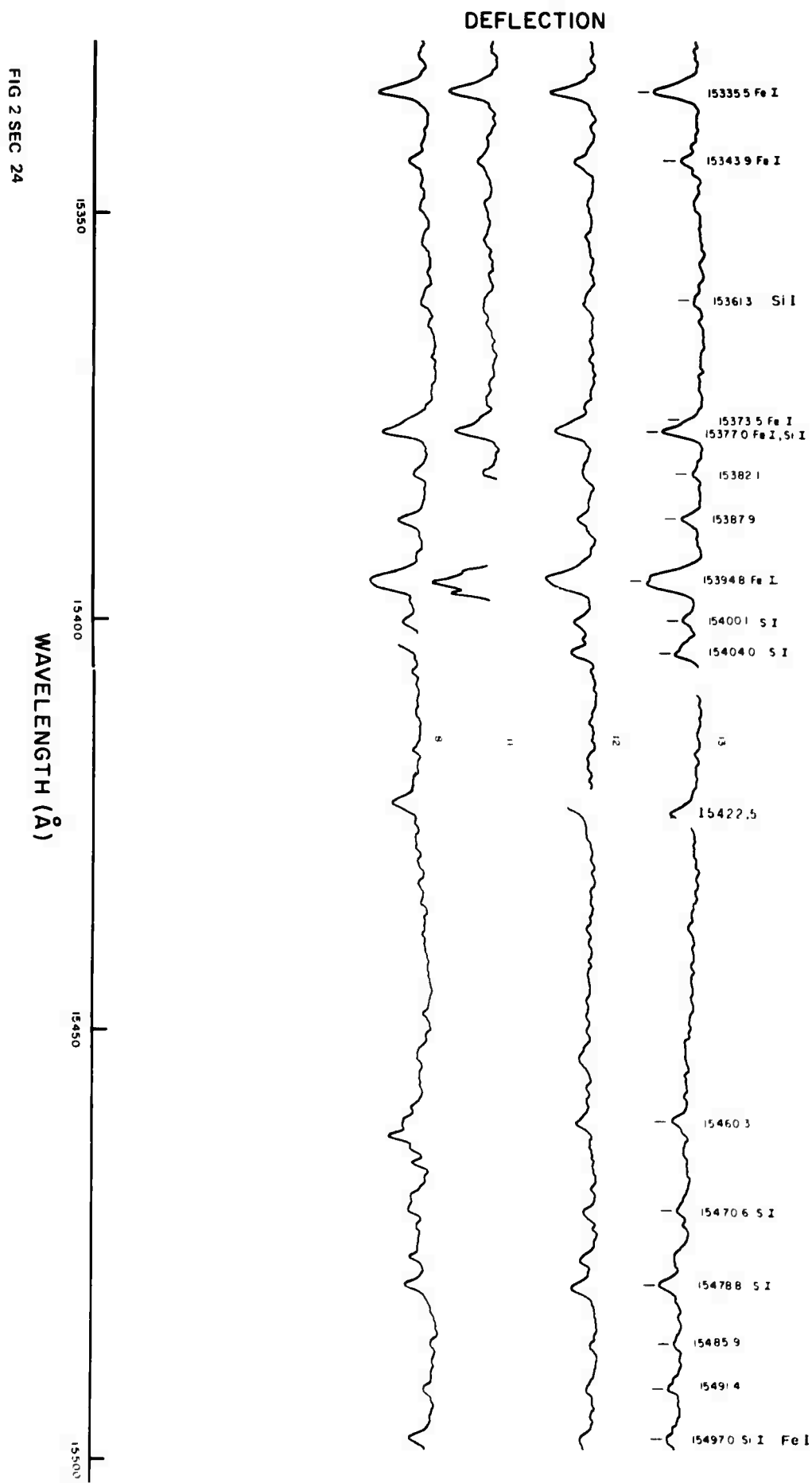
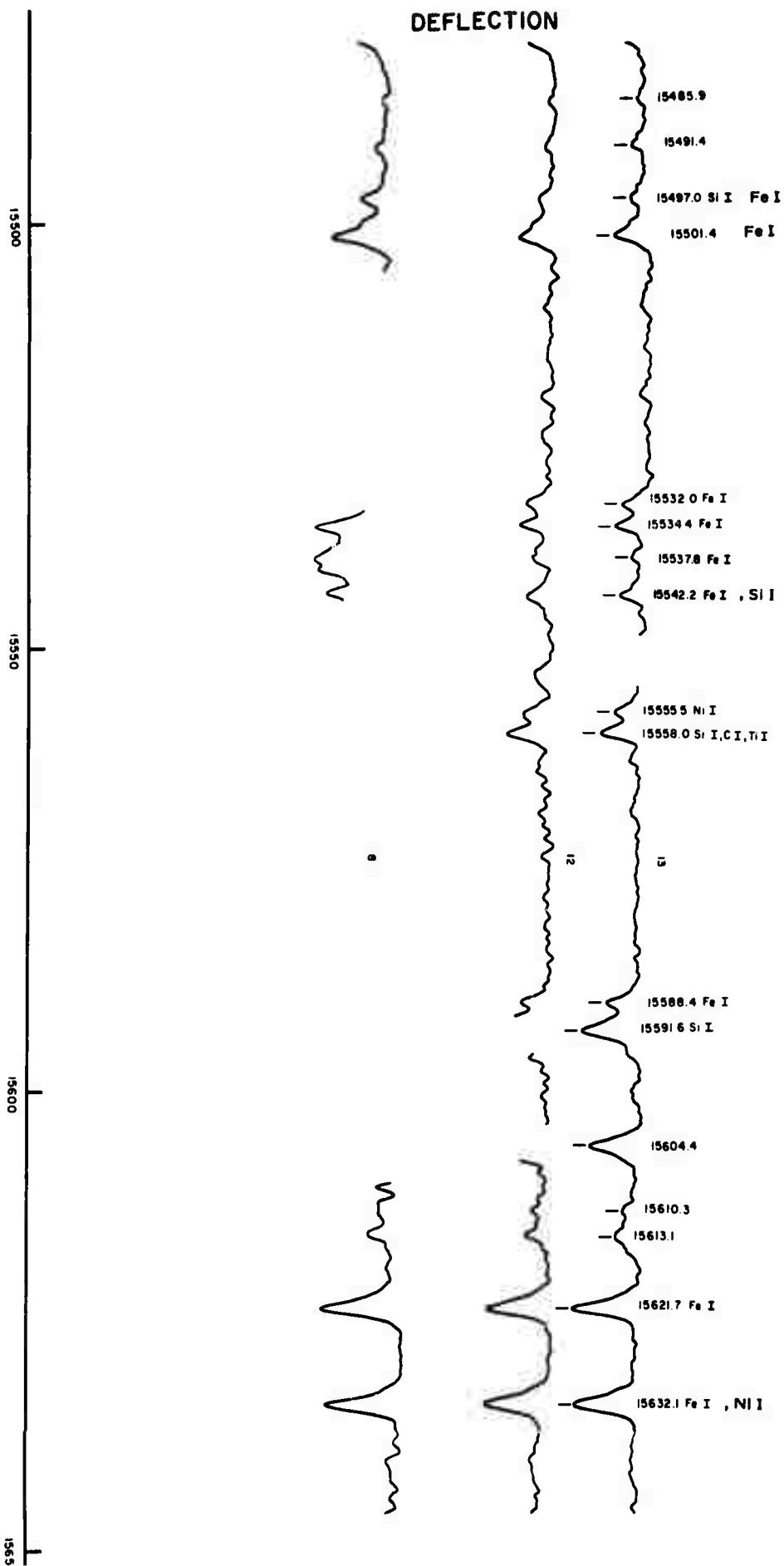


FIG 2 SEC 24

FIG 2 SEC 25

WAVELENGTH (Å)



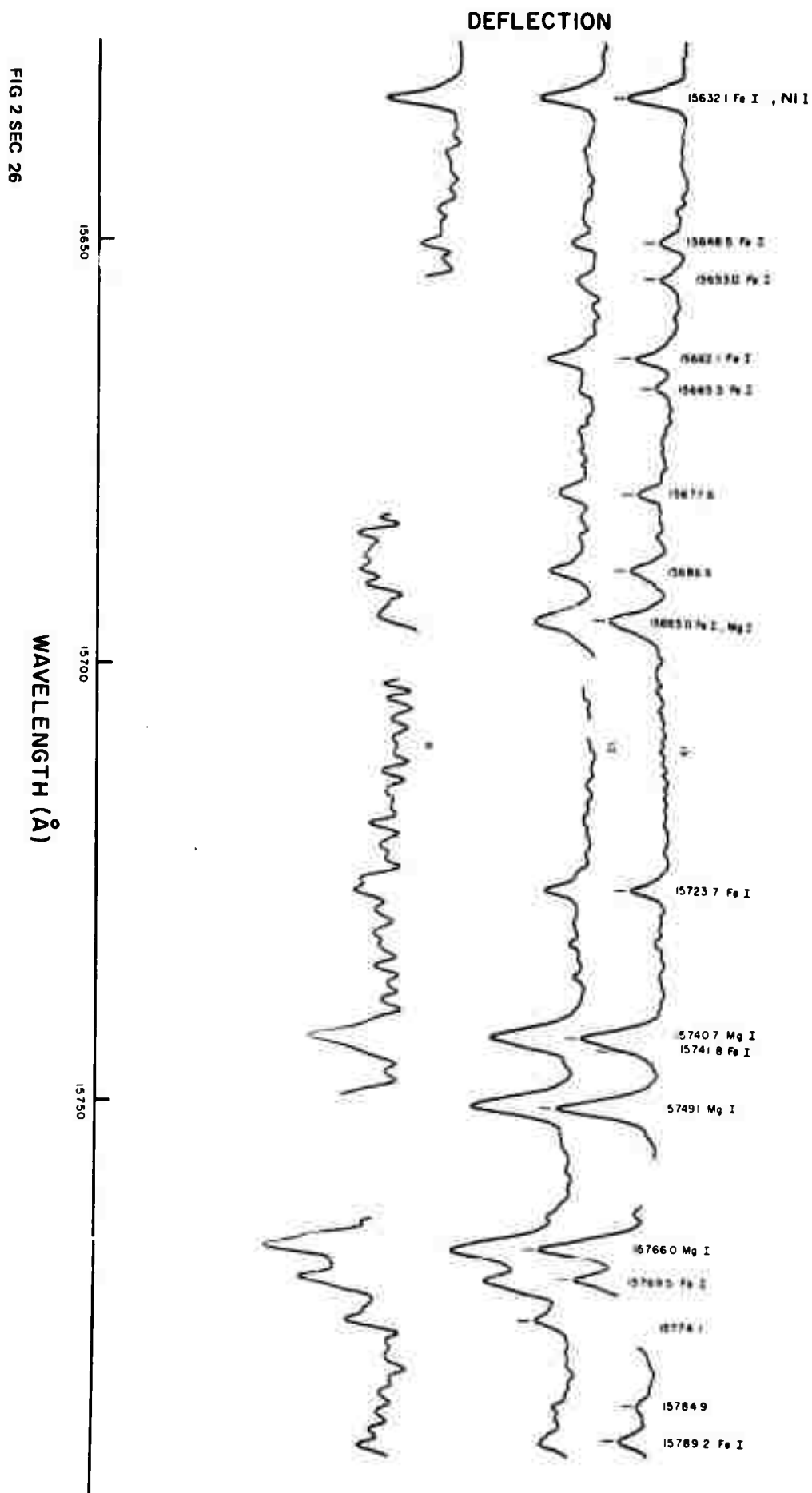


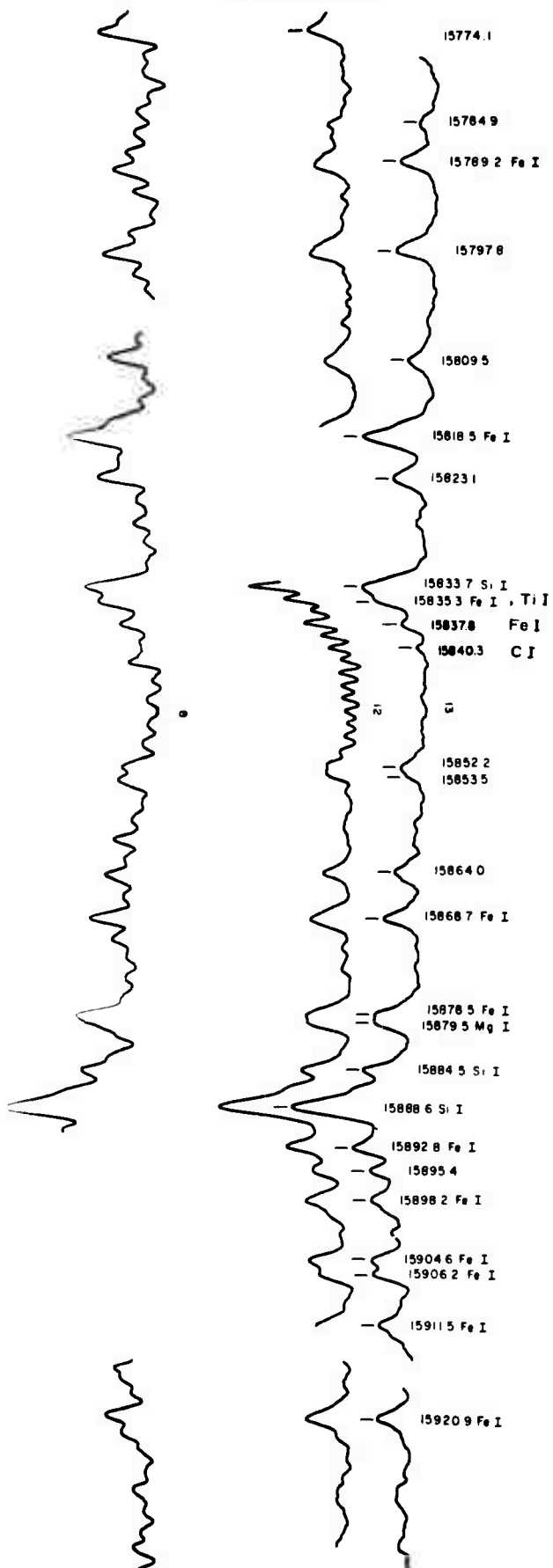
FIG 2 SEC 26

FIG 2 SEC 27

WAVELENGTH (Å)



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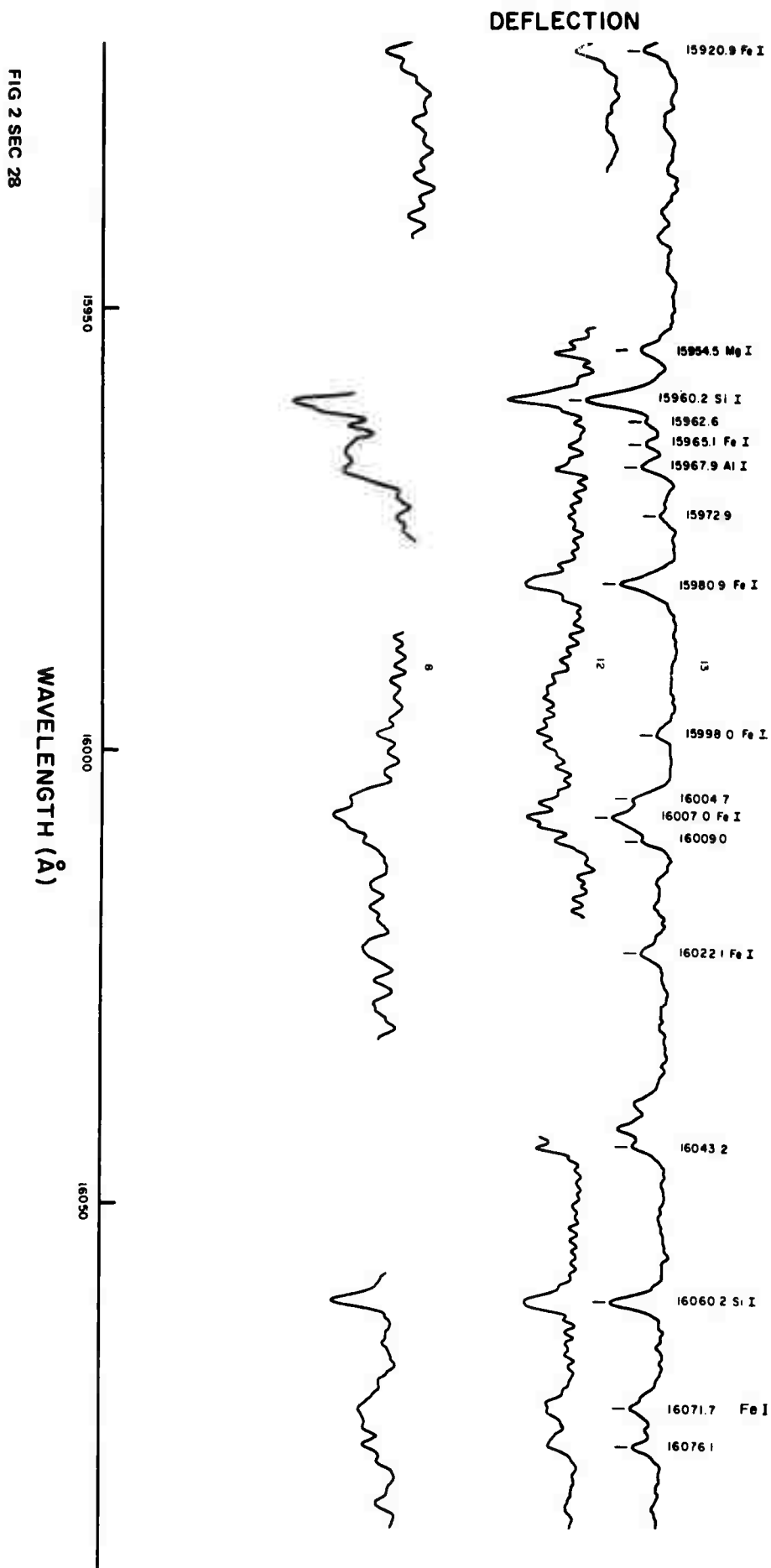


FIG 2 SEC 29

WAVELENGTH (Å)

16100

16150

16200

DEFLECTION

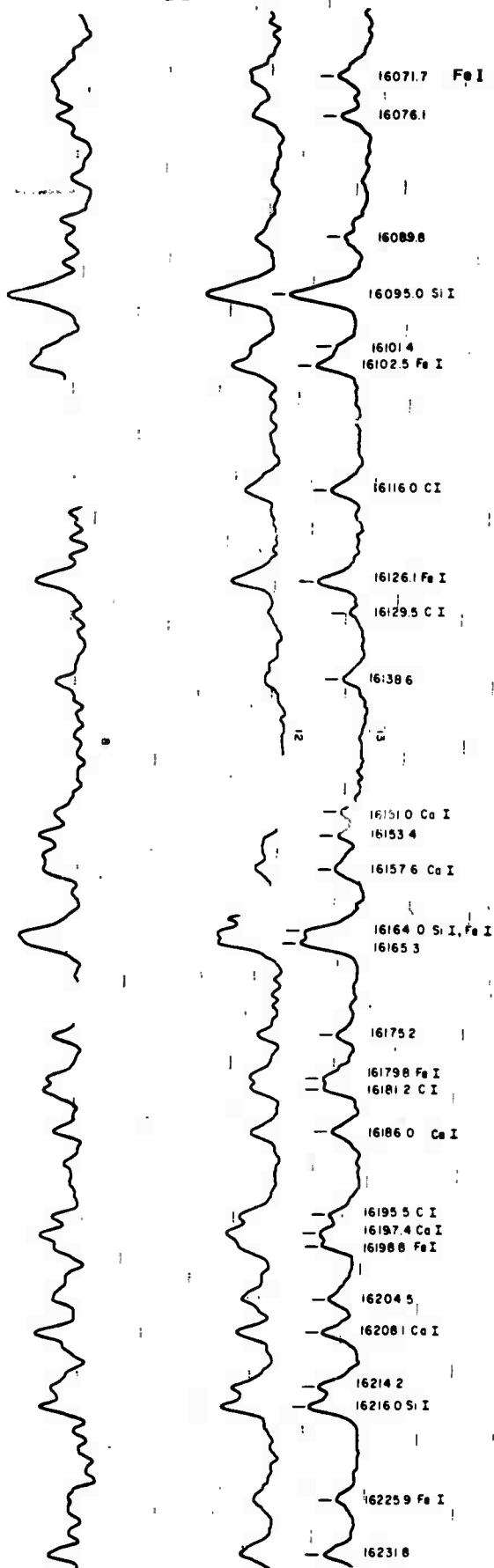


FIG 2 SEC 30

WAVELENGTH (Å)

16250

16300

16350

DEFLECTION

16216.0 Si I

16225.9 Fe I

16231.8

16234.3

16242.1 Si I, Fe I

16246.7 Fe I

16253.2 Ni I

16284.9 Ti I

16293.1 Fe I

16310.6 Ni I

16316.4 Fe I, Si I, C I

16324.7 C I, Fe I

16331.8

16347.3

16363.4 Ni I

16365.0 Mg I

16380.6 Si I

16381.8 Si I, Ti I

FIG 2 SEC 31

WAVELENGTH (Å)

16400

16450

16500

DEFLECTION

16365.0 Mg I

16380.6 Si I

16381.8 Si I , Ti I

16384.8

16388.0

16404.9 Fe I

16434.6 Si I

16436.5 Fe I

16440.3

16445.0 Fe I

16467.1 Fe I

16487.0 Fe I

16506.3

FIG 2 SEC 32

WAVELENGTH (\AA)

16500

16550

16600

16650

DEFLECTION

16506.3

16517.0 Fe I

16524.7 Fe I

16531.7

16541.5 Fe I

16552.1

16562.3

16613.6 Fe I

16646.0 Fe I

16653.9

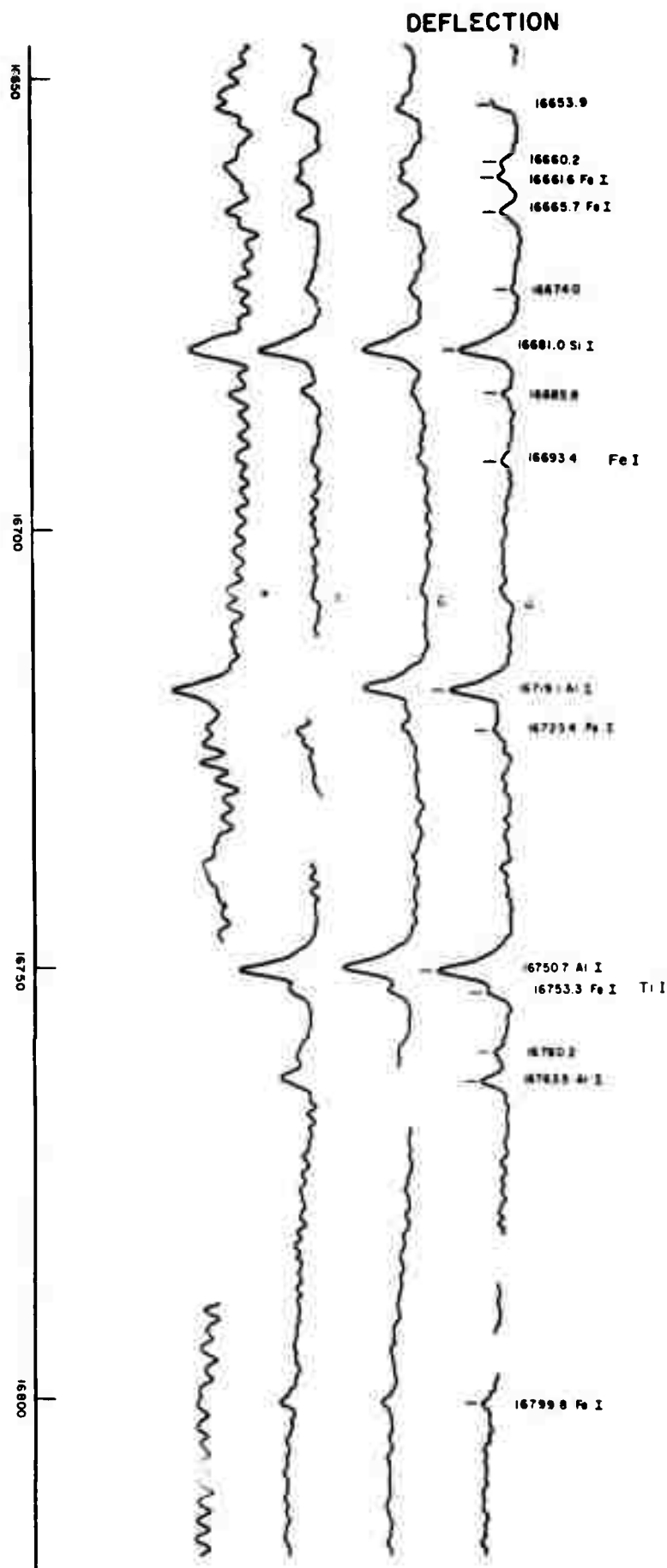
16660.2

16661.6 Fe I

16665.7 Fe I

FIG 2 SEC 33

WAVELENGTH (Å)



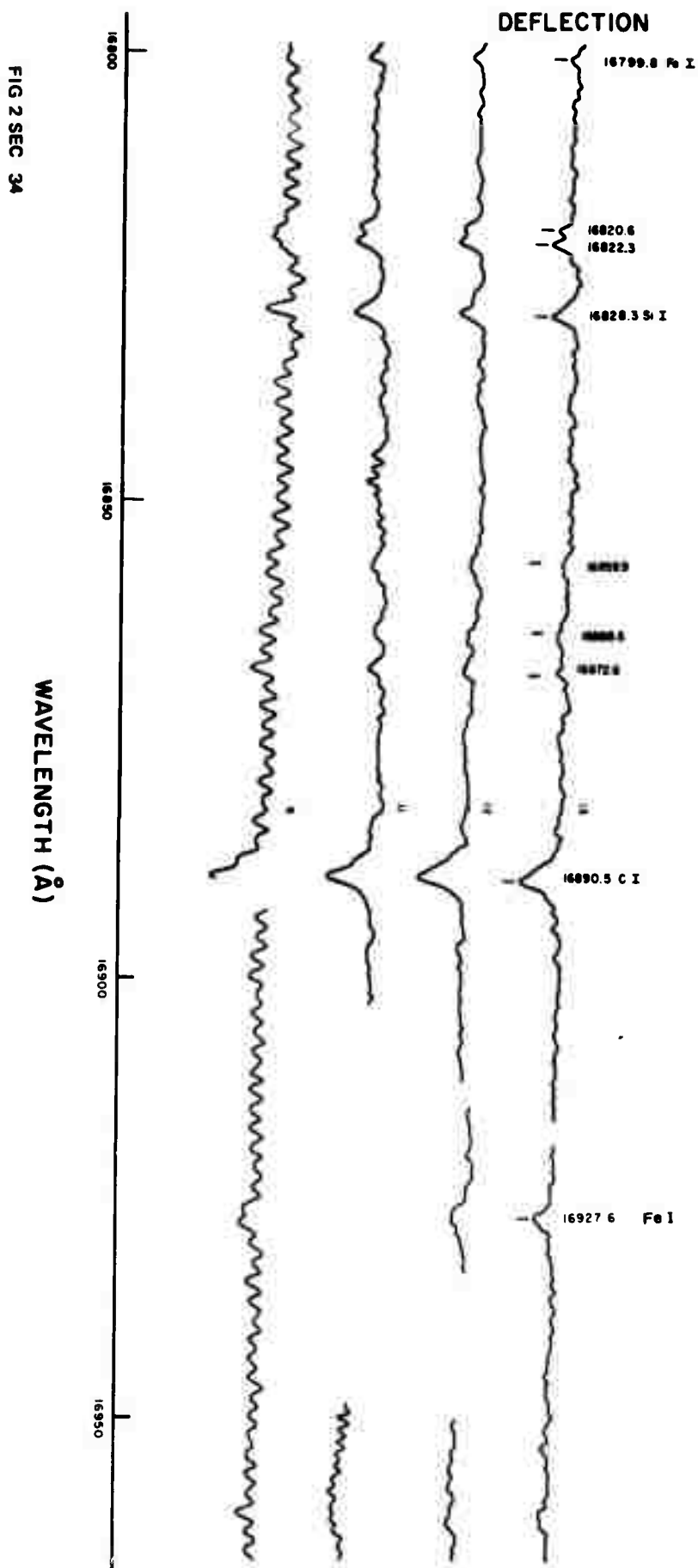
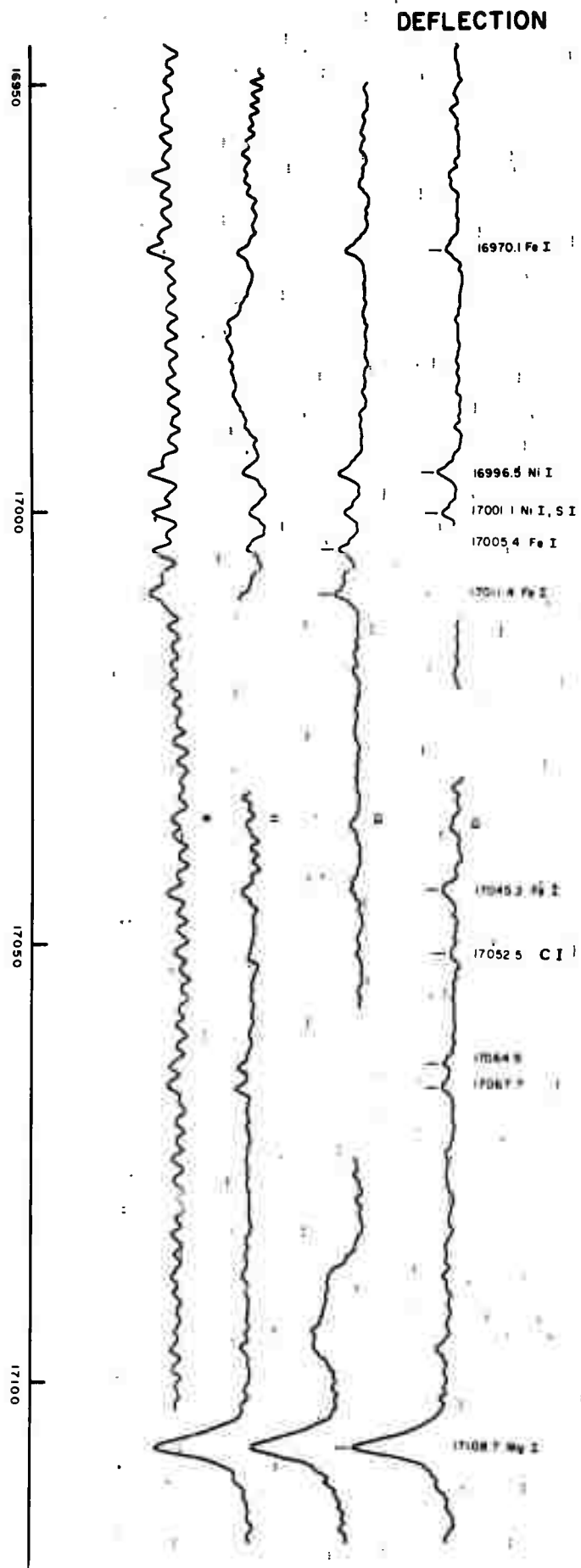


FIG 2 SEC 35

WAVELENGTH (Å)



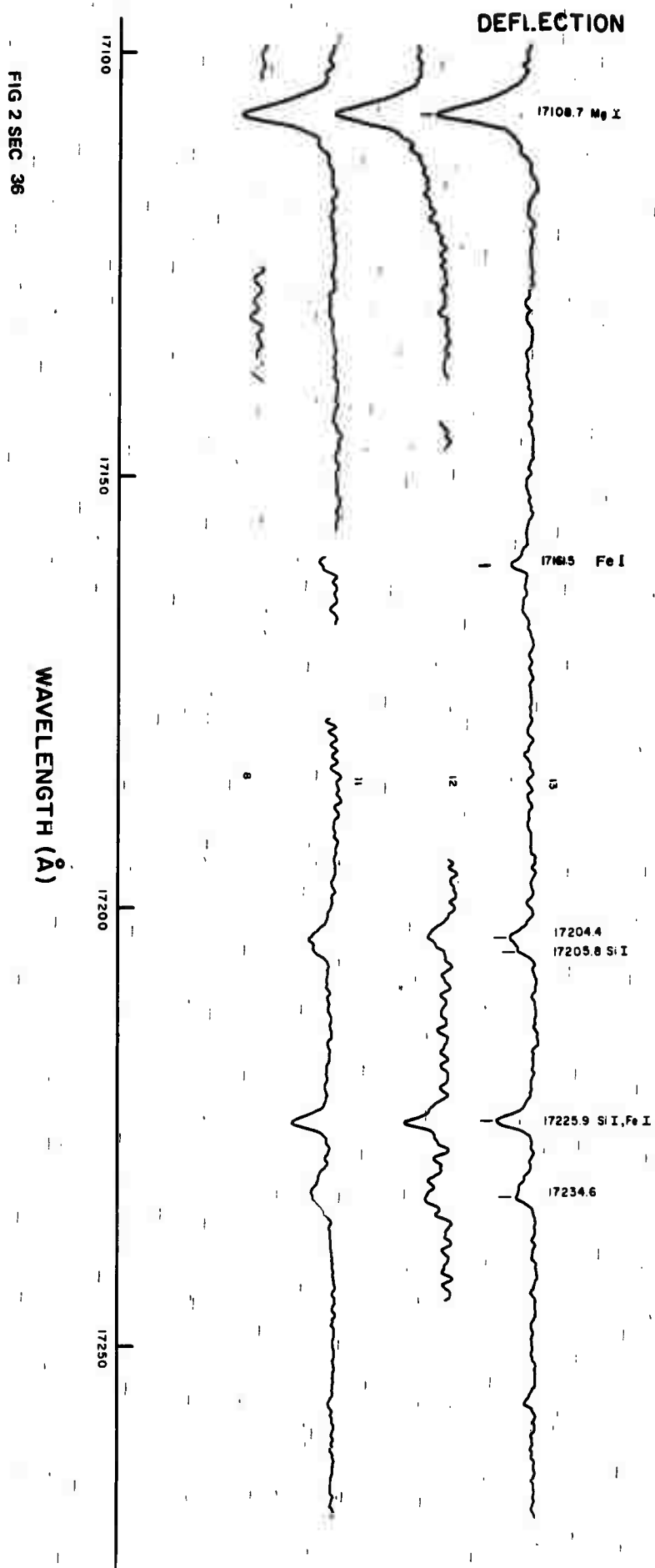
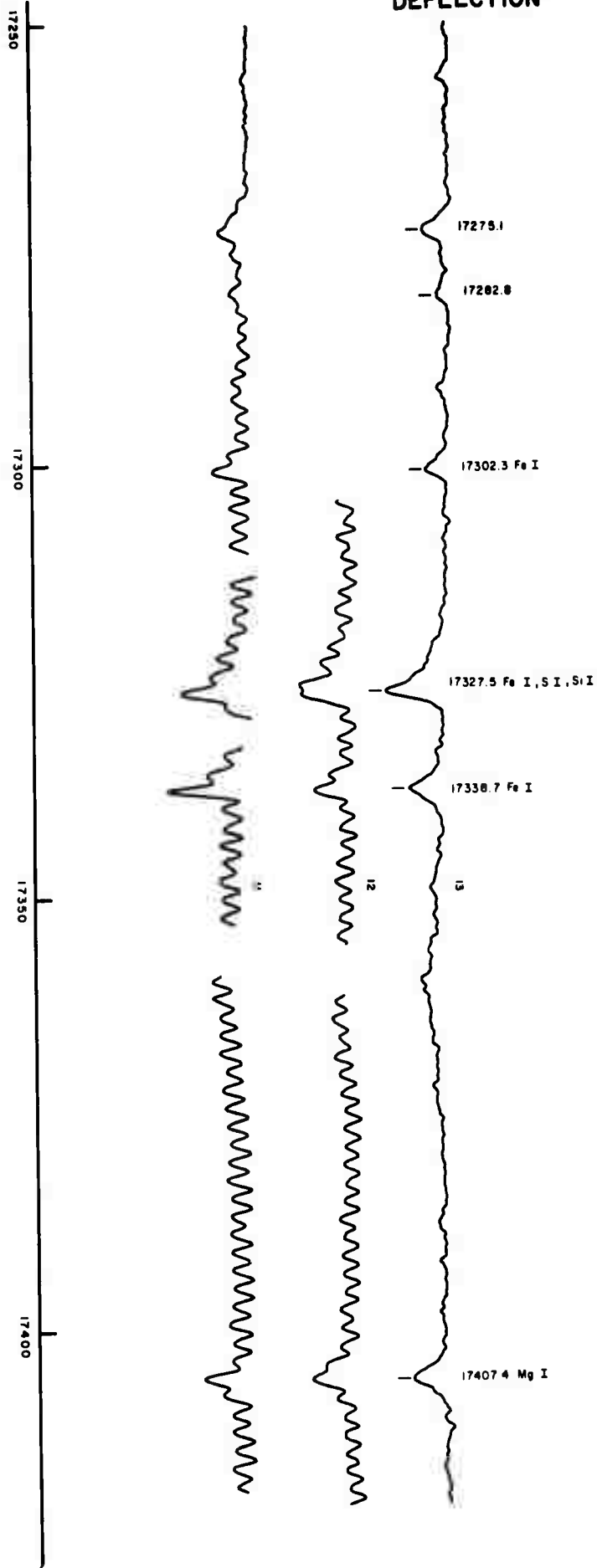


FIG 2 SEC 37

WAVELENGTH (Å)

DEFLECTION



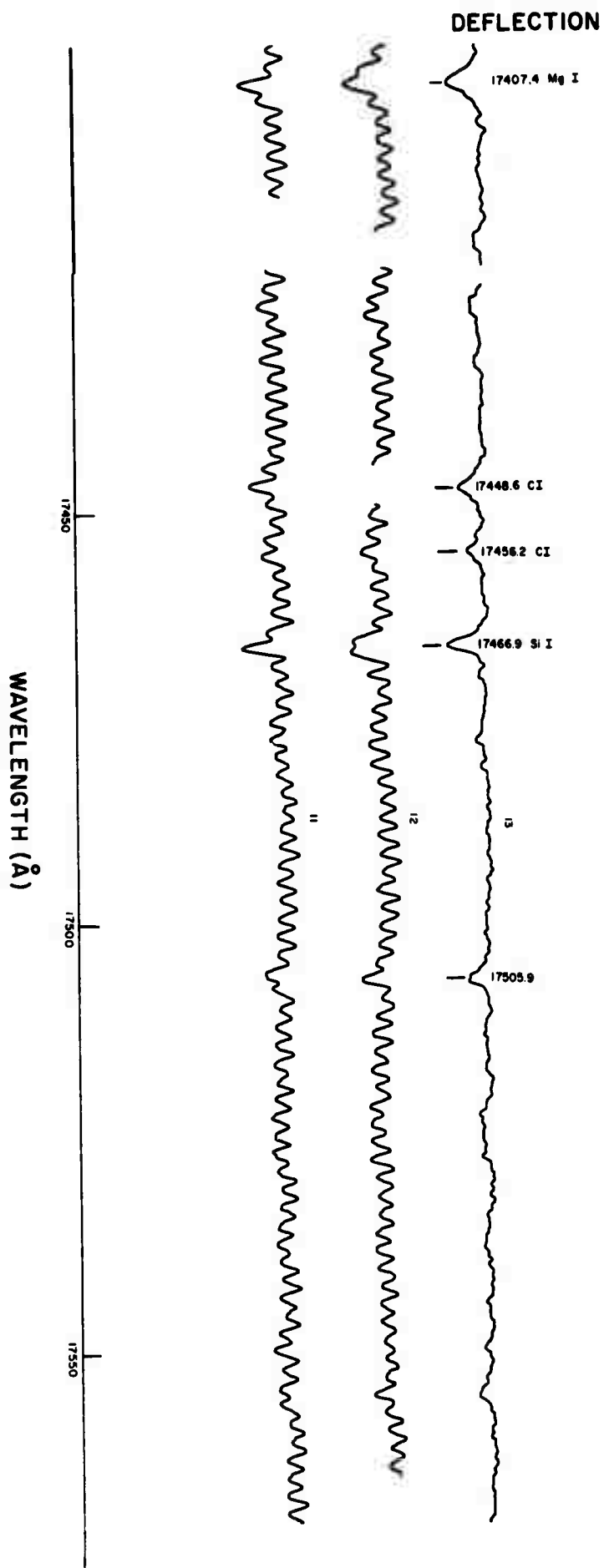
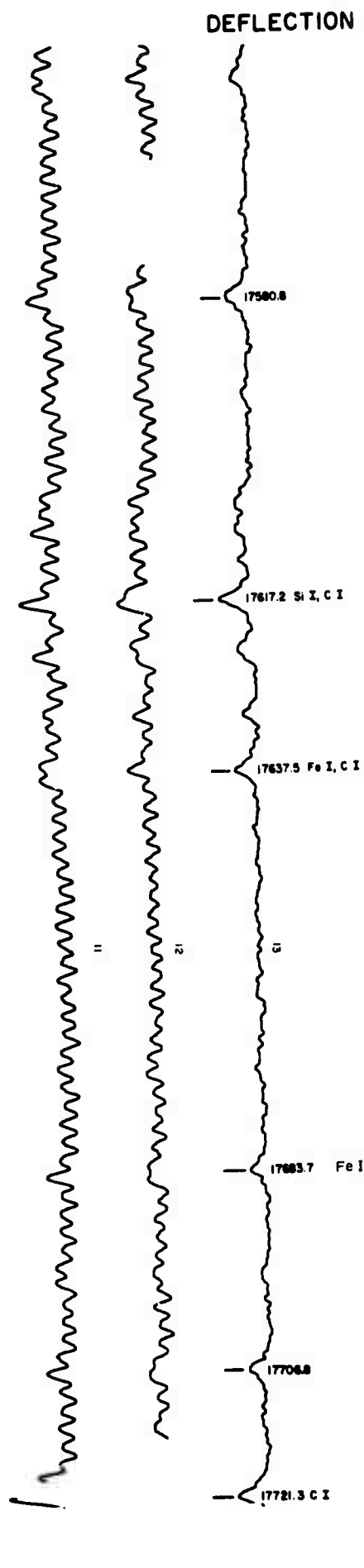
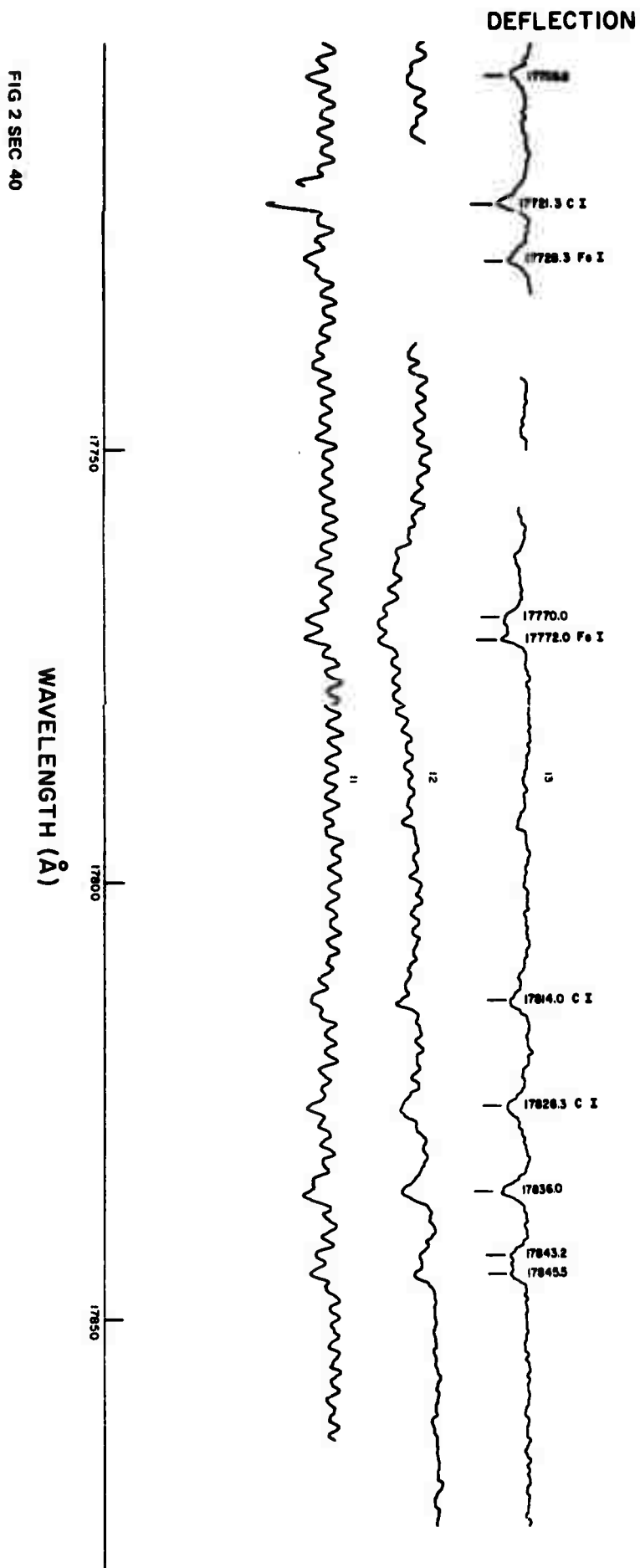
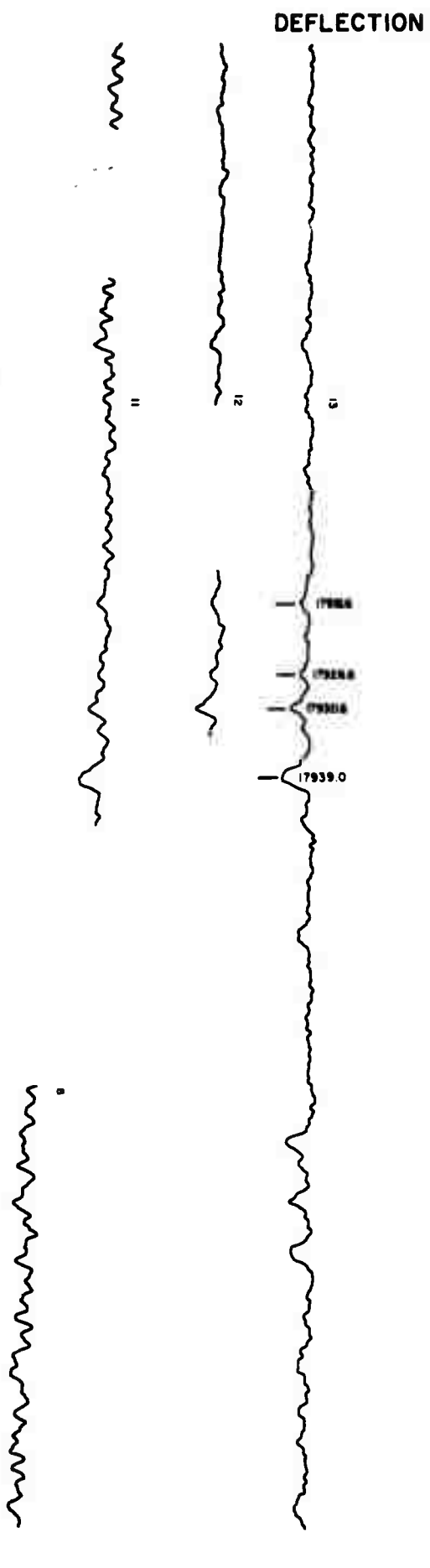


FIG 2 SEC 38

FIG 2 SEC 39







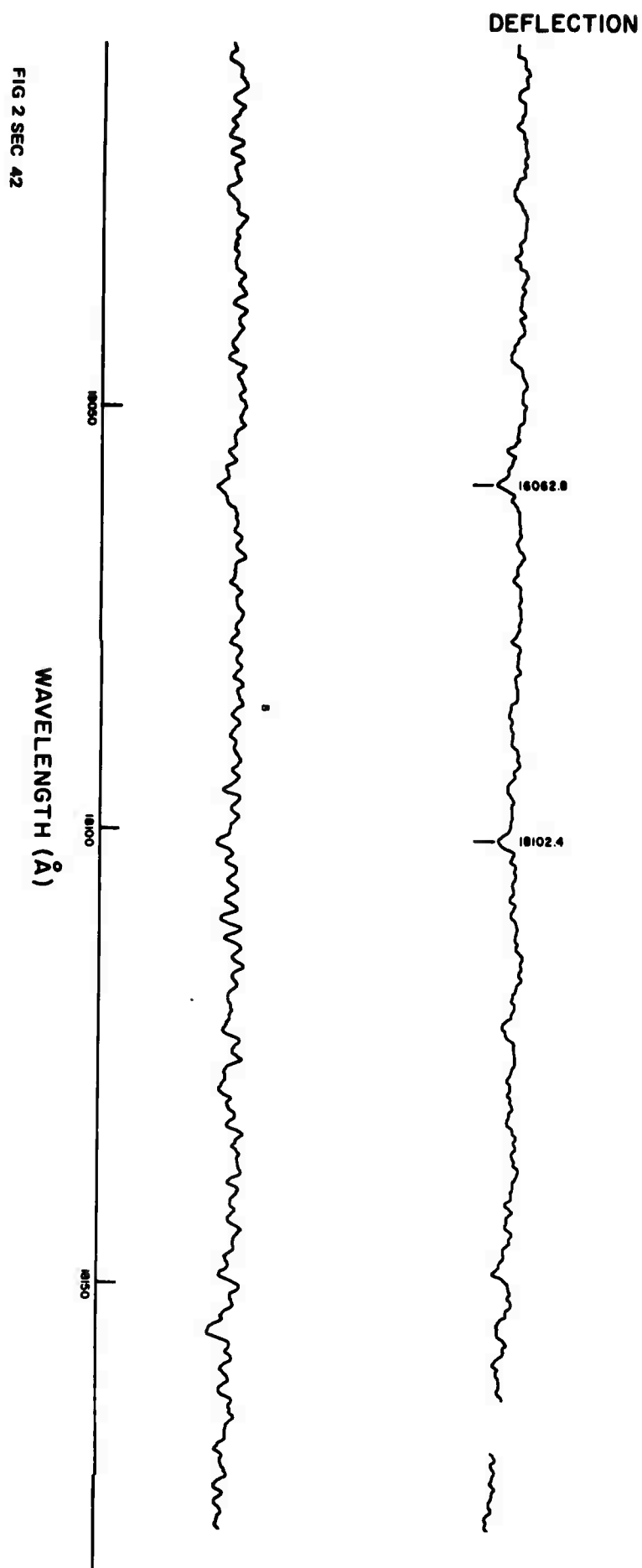


FIG 2 SEC 43

WAVELENGTH (Å)

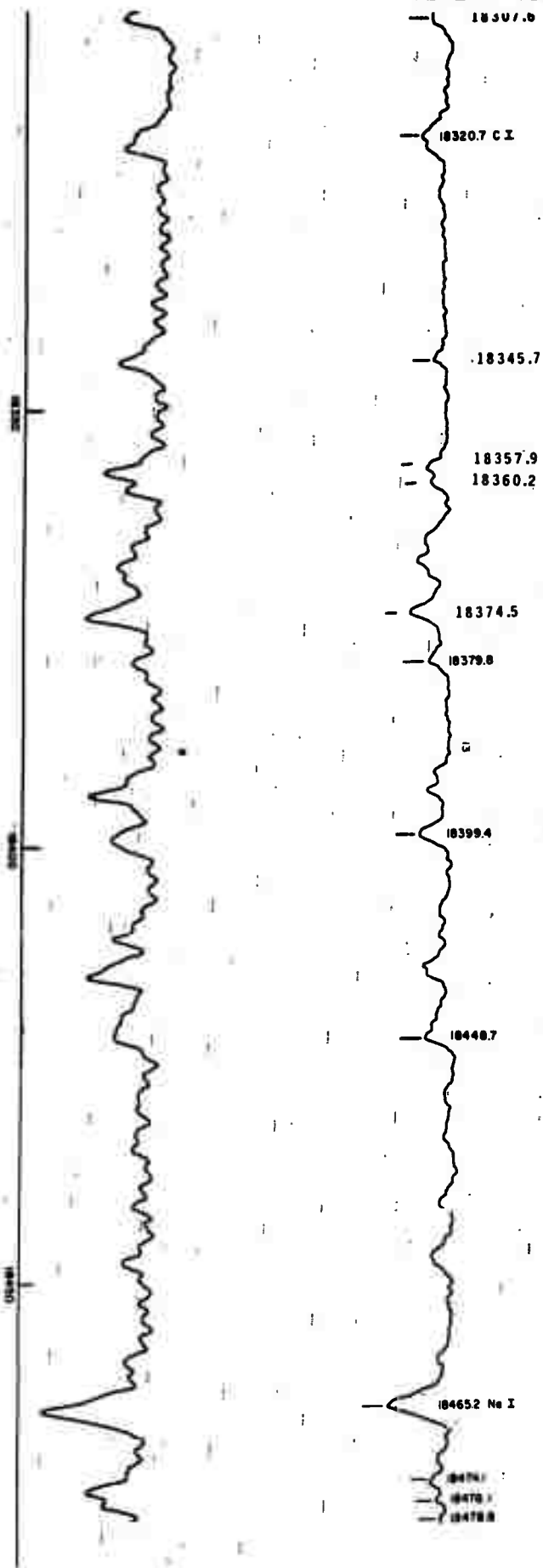


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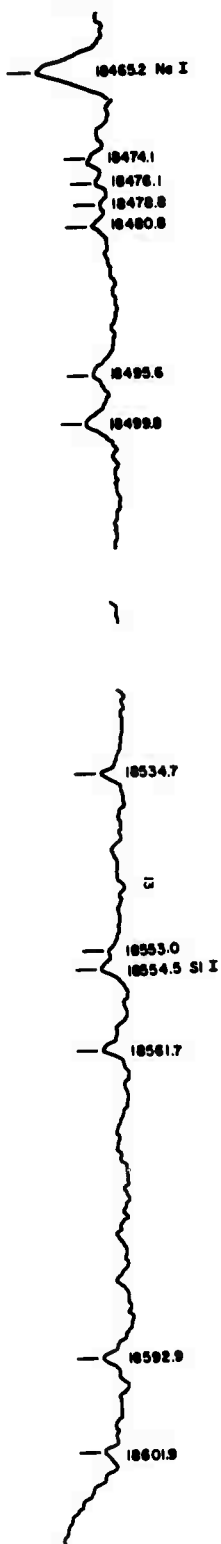


FIG 2 SEC 44

WAVELENGTH (Å)



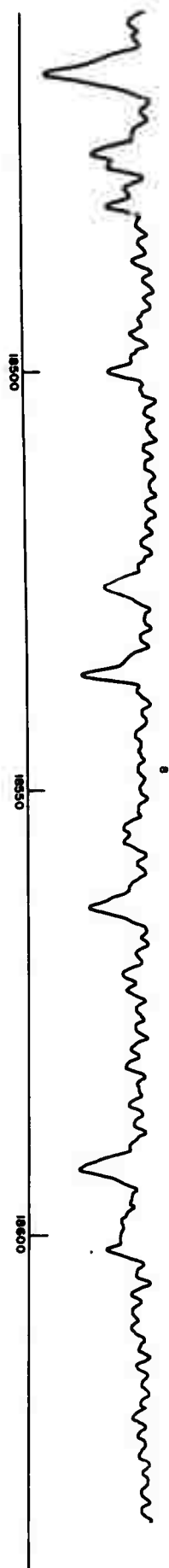
DEFLECTION



60

FIG 2 SEC 45

WAVELENGTH (Å)

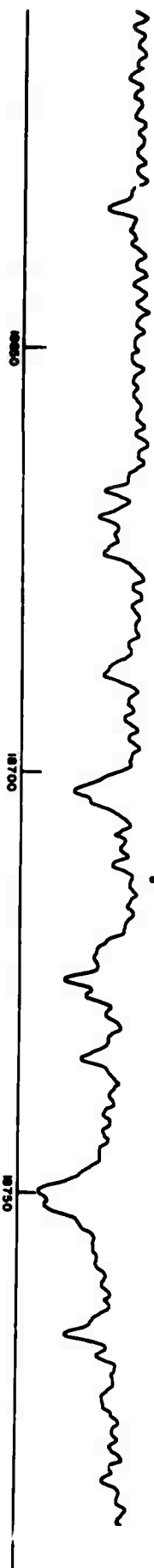


DEFLECTION

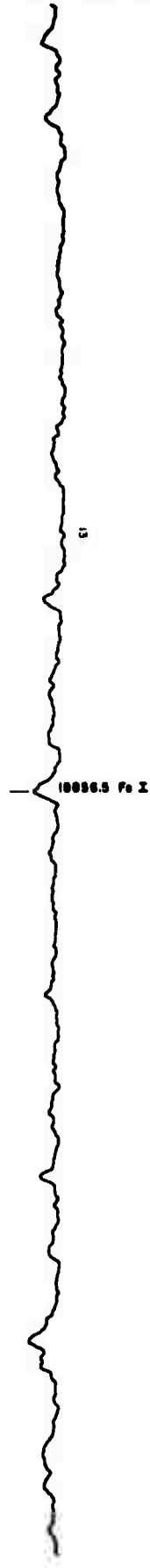


FIG 2 SEC 46

WAVELENGTH (Å)



DEFLECTION



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WAVELENGTH (Å)

DEFLECTION



FIG 2 SEC 48

WAVELENGTH (Å)

TABLE I

Times and Altitudes for the Selected Records Shown in Figures 1-2.

Record No.	Time (MST)	Altitude(kf)
7	7:28 - 7:46	24.5 - 36.5
8	7:46 - 8:04	36.5 - 52.0
9	8:04 - 8:22	52.0 - 62.0
11	8:40 - 8:58	75.3 - 87.0
12	8:58 - 9:16	87.0 - 96.0
13	9:16 - 9:34	96.0 - 96.3
14	9:34 - 9:52	96.3 - 96.3